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finish

*December 1950*

# finish

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# THE **finish** **LINE**

## A FORECAST FOR 1951 PROSPERITY —

as pictured by F. W. McChesney of the General Electric headquarters staff at Schenectady, New York—"a boom limited only by men, materials and industrial efficiency is in prospect with either war or peace."

Yes, that seems to be the studied opinion of the average producer of household and industrial products—but it won't be smooth sailing for the manufacturer of metal products, or products made of plastics, and many other products from a variety of materials.

The job of producing and selling as many finished appliances and allied metal products as possible under tightening supply conditions is one problem, but the problem of planning for possible conversion and getting lined up as a source for war materials is another that only a short sighted management could ignore.

### The metals supply

The pinch has arrived for aluminum and of interest to all **finish** readers is the continued tightening of the steel situation. Production is high but demand is higher. Much has been said about the need for greater steel producing facilities. Production facilities *have* been increased, but steel men point to the fact that this is only one part of the picture—new production capacity means little without a parallel increase in raw material supplies. A severe winter *could* conceivably result in an ore shortage before spring. In contrast it is conceivable that the automobile market, a mammoth consumer of steel, could break and the demand drop faster than the steel supply.

As this is written, the financial pages are full of predictions of another steel price advance. Price advances for *any* important commodities are to be regretted for they must result in a further shrinking of the present much-stretched dollar. As far as many of the manufacturers of home appliances are concerned, any reasonable increase in steel prices at the mill would mean little compared to the hundreds of thousands of dollars that are currently being spent for "premium price" steels to maintain high production rates.

### The raw materials "pinch"

Steel gets the spotlight, but there are other materials in short supply which can offer comparable problems to the metal products manufacturer.

(The full story on Cobalt is not included—too late for this issue.)

Cobalt was the magic word a few short weeks ago when it appeared that its use was to be prohibited for civilian production. No cobalt would mean no cobalt bearing ground coat enamels. At the extreme this could mean the eventual closing of all plants producing home appliances and other porcelain enameled products. It now appears that a far less drastic cobalt order may appear.

Titanium has had the organic finish producers on the treadmill for some time. It hasn't crippled the protective coating industry, but the pinch is certainly serious in connection with the production of some of the finest organic coatings.

We could go on and on with references that tend to spread the gloom of materials shortages. The solid fact remains that in practically every case *some* provision will be made to prevent a collapse of important producing industries as a result of arbitrary restrictive orders.

### Defense orders

It will require leaders adept at tight rope walking to hold to a timetable that will keep production and resulting national income high on peacetime goods while at the same time draining off materials, production facilities, and manpower for defense requirements.

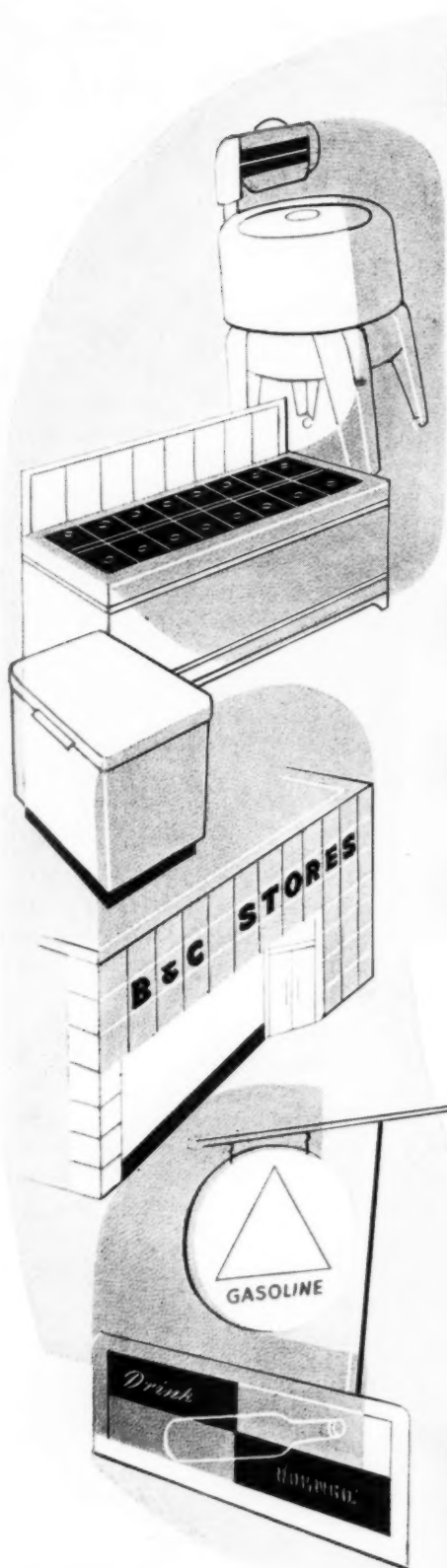
There's one big difference in the manufacturing picture from the situation at the beginning of World War II. The word *experience* represents that difference. The manufacturers who floundered for months before in an attempt to find something to produce and then had to learn how to produce it are in many cases in position to roll up their sleeves and go to work.

Production remains predominantly for peace, but the good Boy Scout slogan "Be Prepared" could never be learned at a better time than now.

We hope you won't be required to convert but better to have your foot in the defense production door. You will see **finish** converting too (editorially) when the time is ripe so that we can continue to serve our readers.

For now, it's "full steam ahead" with production of the many metal products needed for the home and in industry.

*Dana Chase*  
EDITOR AND PUBLISHER



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*Showing a weld crack located near the base of a lug welded to a magnesium casting.*

## A new technique for inspecting metals

a simple inspection technique for all metals that can be used  
on the production line or out in the field

*by Gilbert C. Close* • FINISH CORRESPONDENT

**T**HOUGH several dye penetrant inspection techniques have been available in the past, a new development along this line promises to out-strip them all in simplicity, convenience, and accuracy of results. The process was developed by engineers of Turbodyne Corporation to check gas turbine parts and welds for cracks and porosity either prior to or

after final assembly of the engine.

This new process requires no specialized equipment other than the chemicals used, and can be employed as readily in the field as it can on the production line. It is valuable also for spot-checking parts after they have been mounted in assembly, for periodic checking of welds for fatigue cracks, and for checking gas-

or liquid-tight fittings for porosity.

### **Results correlate with microscopic inspection of sectional parts**

In a private demonstration before the author, surface defects in highly critical gas turbine engine parts were consistently revealed. When these parts were then sectioned, etched, and examined under the microscope, the



*Applying dye penetrant to a radial engine crankshaft.*



*Cleaning away the dye penetrant from the surface.*

defects were found to be very real and extremely dangerous from the standpoint of operational stress concentrations. In some cases, defects revealed by the test method could not be detected with either magnetic or X-ray inspection. Demonstrations of the process before officials of the Civil Aeronautics Administration, the Army Air Forces, and the Navy Bureau of Aeronautics lead to approval of its use pending the issuance of applicable control specifications.

Three chemicals are used in the process—a cleaner, a dye penetrant, and a developer. These chemicals are non-toxic and non-corrosive in character. They are applied to the part being inspected by dipping, brushing or spraying, depending upon the size of the part, the number to be inspected, and the location. The chemicals may be applied from small jars which, along with a small brush for application, makes a very convenient and portable field kit, or a kit for use at various points along the production line.

#### **A four-step process**

In the first step of the process, the

part or area to be inspected must be thoroughly cleaned. Generally, this can be accomplished with the process cleaner. If heavy scale or grease is

#### **Editor's Note:**

The author is convinced that this new inspection method is one of the outstanding technical developments of the year.

The process is now being used by oil pipeline companies, engine manufacturers, and welding concerns. Readers of *finish* can readily judge its possibilities for application in their plants for peacetime or war product inspection.

Requests for additional information on this inspection technique should be sent direct to *finish*.

present, a pre-cleaning method should be used prior to final cleaning. When large batches of parts are involved, any good commercial cleaner followed by vapor blasting or acid etching may be used in place of the process cleaner. Parts should not be cleaned by sand- or grit-blasting as the impact of the abrasive particles tends to peen shut small surface discontinuities. For ordinary work, the part may be cleaned at room

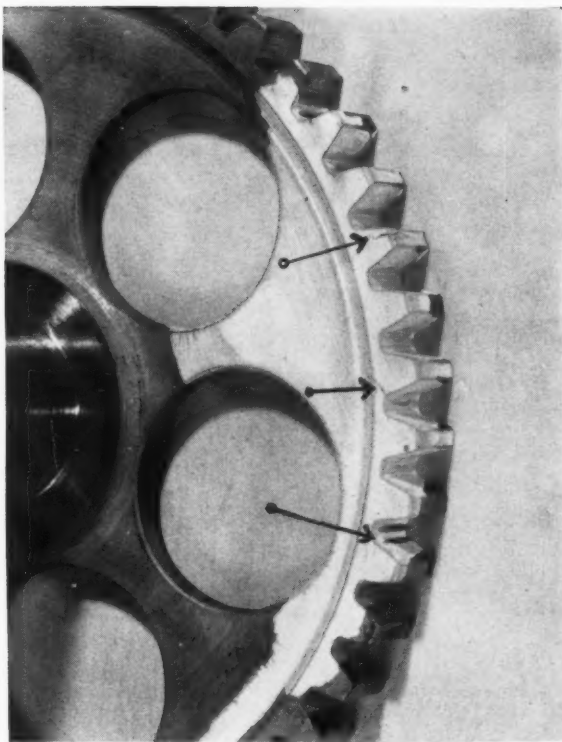
temperature, but when maximum sensitivity is desired part temperature should range from 100° to 150° F.

Next step is to apply the dye penetrant to the part. This is a brilliant red solution. It may be applied by dipping, spraying or brushing, and while no soaking time is required, the surface to be inspected should be thoroughly covered. The dye requires about five minutes to dry. When very small surface defects are suspected, such as grinding checks, etc., sensitivity may be increased by applying two or three coats of dye, or by immersing the part in the dye for two or three minutes then allowing it to dry. This dye penetrant is a critical solution and the key to the success of the process. It is a chlorinated hydro-carbon with practically no viscosity and with capillary action and surface tension characteristics well balanced for maximum penetration into the cracks and subsequent withdrawal by the developer.

In step three of the process, the dye is completely removed from the surface of the part. In field kits, a second container of the cleaner is used for this purpose. The parts



*Showing application of the white developer film.*



*Arrows point to cracks revealed in machined spur gear.*

may be either dipped in the cleaner and agitated, or the cleaner may be applied with a brush then wiped away with a tack rag. The parts should not be soaked in the cleaner as it may weaken the subsequent defect indications. All traces of the dye must be removed as its entrapment in surface scratches or marks, or in rough areas, would result in false indications. When the dye is thoroughly removed, surface scratches that consistently give false indications during magnetic inspection will not show up with this method.

Fourth step of the process is application of the developer. This solution is a super-saturated concentration of white solids in a highly volatile liquid phase, and as the solids settle out during storage or periods of unuse, the developer must be well stirred or shaken just prior to use. Here again, brush, dip or spray methods of application may be used. The coating should be as thin as possible to aid in subsequent estimation of the depth and general characteristics of any fault revealed. At the same time, the surface of the part must be thoroughly covered. This

solution dries rapidly, but drying may be speeded by low heat or a gentle blast of compressed air.

The part must be watched closely while the solution dries. The dye penetrant which has remained in any cracks or surface discontinuities will be rapidly drawn to the surface and appear as a bright red line against the white background of the developer. It is here that the balanced surface tension characteristics of the dye penetrant come into play, for, if given time, all the dye in the crack will be drawn out and diffused through the developer coating. Thus, with practice the inspector can estimate the extent of the fault by the final width of the red line.

#### **Interpreting the results**

In interpreting results, any appearance of red on the white developer coating means a surface discontinuity of some time. An initial sharp red line indicates a crack or cold shut. Red dots indicate pits or porosity. A series of red dots in a line indicates a tight crack, cold shut, or partially welded lap. After this initial appearance of red, the depth

of the defect may be estimated by watching the width of the indication grow as more and more dye is withdrawn from deeper and deeper in the crack. This action will continue until all the dye is withdrawn.

When a very fine or tight crack is suspected, a full minute is allowed for the first appearance of the red line. No indications will show from scratches or tool marks if the dye has been properly cleaned away.

The process cannot be used to reveal surface inclusions or slag or dross unless they are very porous, nor is the process applicable to inspection for sub-surface defects of any kind. There must be an actual physical opening in the surface of the metal or weld into which the dye penetrant can enter.

#### **For magnetic or non-magnetic materials**

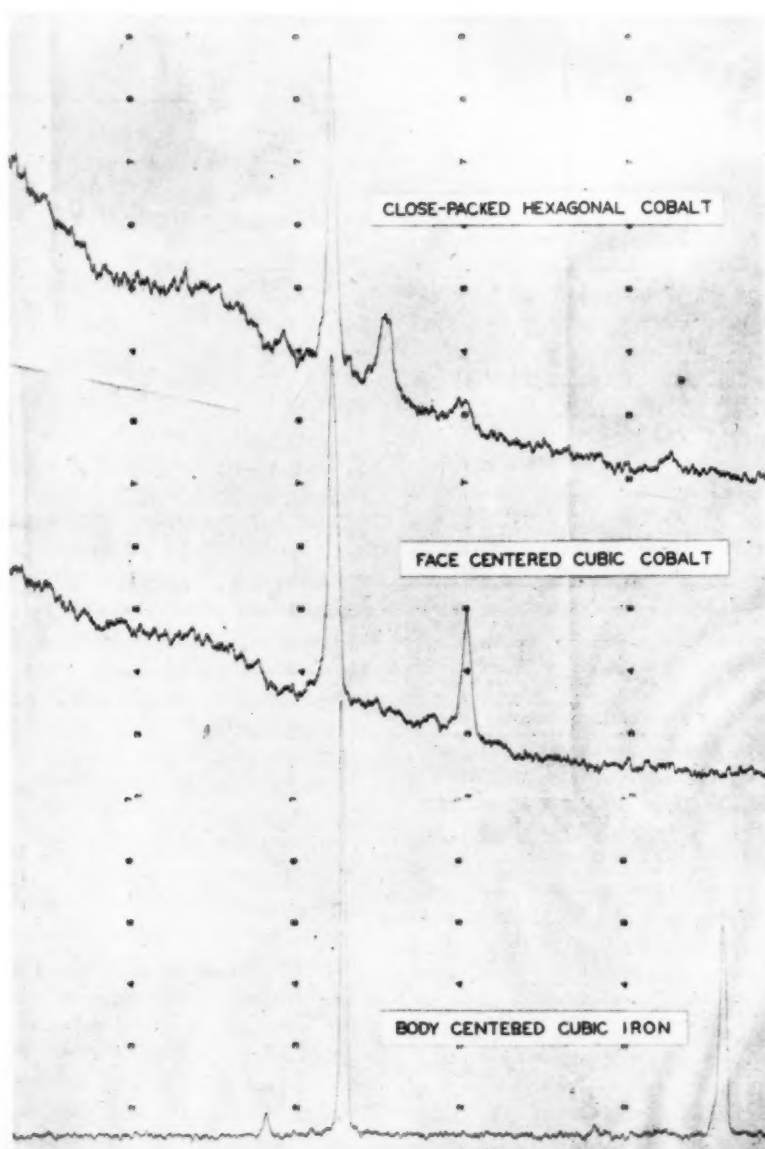
The process can be employed with equal success on magnetic or non-magnetic materials. It will reveal any surface defect in anodized aluminum, and works very well with the new titanium alloys. Heli-arc, gas, and

*to Page 48 →*

# Cobalt reduction theory of sheet iron enamels

a progress report from an intensive study of the structure of sheet iron  
ground coats and the function of cobalt in the development of adherence

by *J. H. Healy* AND *A. J. Andrews* • DEPARTMENT OF CERAMIC ENGINEERING,  
UNIVERSITY OF ILLINOIS, URBANA, ILL.



In an intensive study of the structure of sheet iron enamel ground coats, pertinent data relative to the function of cobalt in the development of adherence have suggested a logical theory which explains not only the factual data obtained by the authors but also the conditions and facts described and discussed by the writers on the subject.

The dendrites, at the interface and extending from the iron base into the enamel which were described by King (Ohio State University), have by the use of modern improved X-ray techniques been positively identified as pure cobalt metal. (See Figure 1) This fact, and further data showing that the cobalt oxide in the ground coat glass can be reduced to metallic cobalt under proper conditions, leads logically to the cobalt reduction

Figure 1 — X-ray diffraction pattern of body center cubic iron, face center cubic cobalt, and close-packed hexagonal cobalt.



Figure 2—Cobalt dendrites in sheet iron ground coat enamels.



theory for enamel adherence. Other data both by the authors and former investigators all support this theory without exception.

**Theory:** In the firing of a cobalt ground coat, the iron is oxidized to iron oxides at the interface between the enamel and the iron. As soon as the glass melts, the hydrogen evolved from the iron or formed from water at the interface is sealed in. This hydrogen, however, is rapidly consumed in the reduction of the iron oxides at the interface to form metallic iron and in the reduction of the cobalt oxide in the glass at the interface between the iron oxide and the glass to form cobalt metal. These phenomena result in accounting for a large part of the hydrogen which would otherwise form an insulating layer between the molten enamel and the iron. It is not believed that all of the iron oxide is reduced to metallic iron, but that an appreciable amount of it dissolves in the glass. Any iron oxide in excess of that necessary in the oxidation of the hydrogen most certainly dissolves in the glass.

The result of these phenomena is an intimate contact between the molten glass and the reduced cobalt

and iron, and the parent metal. Cobalt and iron alloy readily, and both metals conduct hydrogen ions; therefore, a glass to cobalt to iron triple adherence is to be expected.

In later firing phenomena, further flow of hydrogen ions from the iron

out. These dendrites actually penetrate the bubbles close to the steel, explaining the importance of bubbles in relieving the pressure of hydrogen evolved from the iron after the enamel has cooled. This supports the explanation by Deringer (A. O. Smith) of the importance of the bubbles to relieve the hydrogen pressure as a means for decreasing the fishscaling tendency of enamel. At elevated temperatures, hydrogen conveyed to the bubbles in this way is actually consumed by reducing the cobalt oxide in the glass interface of the bubble. In all these phenomena it should be recalled that the literature definitely states that water is soluble in the glass at all temperatures. An excess of water may form bubbles.

This theory is closely related to the plating theory promoted by Staley (Metal & Thermit), but evidence now available indicates that the phenomenon is one of chemical reduction rather than plating. In this cobalt reduction theory the oxide layer described by Kautz (Climax Molybdenum) is utilized as one step in the development of adherence.

This investigation is being continued and will be published in detail when completed.

#### Editor's Note:

Over a period of years there have been few subjects in the enameling field that have had more thorough attention than the problem of adherence development. Prominent in the literature and discussions has been the consideration of cobalt.

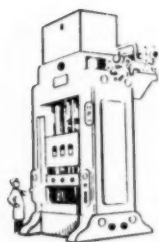
The investigation covered in this article is being conducted by Mr. Healy, the senior author, as a partial fulfillment of the requirements for the degree of Doctor of Philosophy in Ceramic Engineering at the University of Illinois. Readers of *finish* will recognize Prof. Andrews as Head of the Department of Ceramic Engineering at the University of Illinois, and also as Technical Consultant for *finish*.

is readily passed through the cobalt and further reduces the cobalt oxide in the glass. It is at this stage that the cobalt dendrites grow, thus consuming hydrogen which can pass in ion form to the end of the dendrites, permitting them to grow and branch



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# The synthetic enamel department goes modern

metal preparation and synthetic finishing operations for refrigerators and home freezers—electrostatic spraying used

by *Russell Wydeen* • SUPERVISOR, SYNTHETIC ENAMEL DEPARTMENT, SEEGER REFRIGERATOR COMPANY, ST. PAUL, MINNESOTA

REFRIGERATORS and home freezers now rolling off the assembly line at the Seeger Refrigerator Company pass through one of the most modern and complete paint finishing departments to be found anywhere in the country today. Only recently completed and put into operation, it utilizes the latest method of

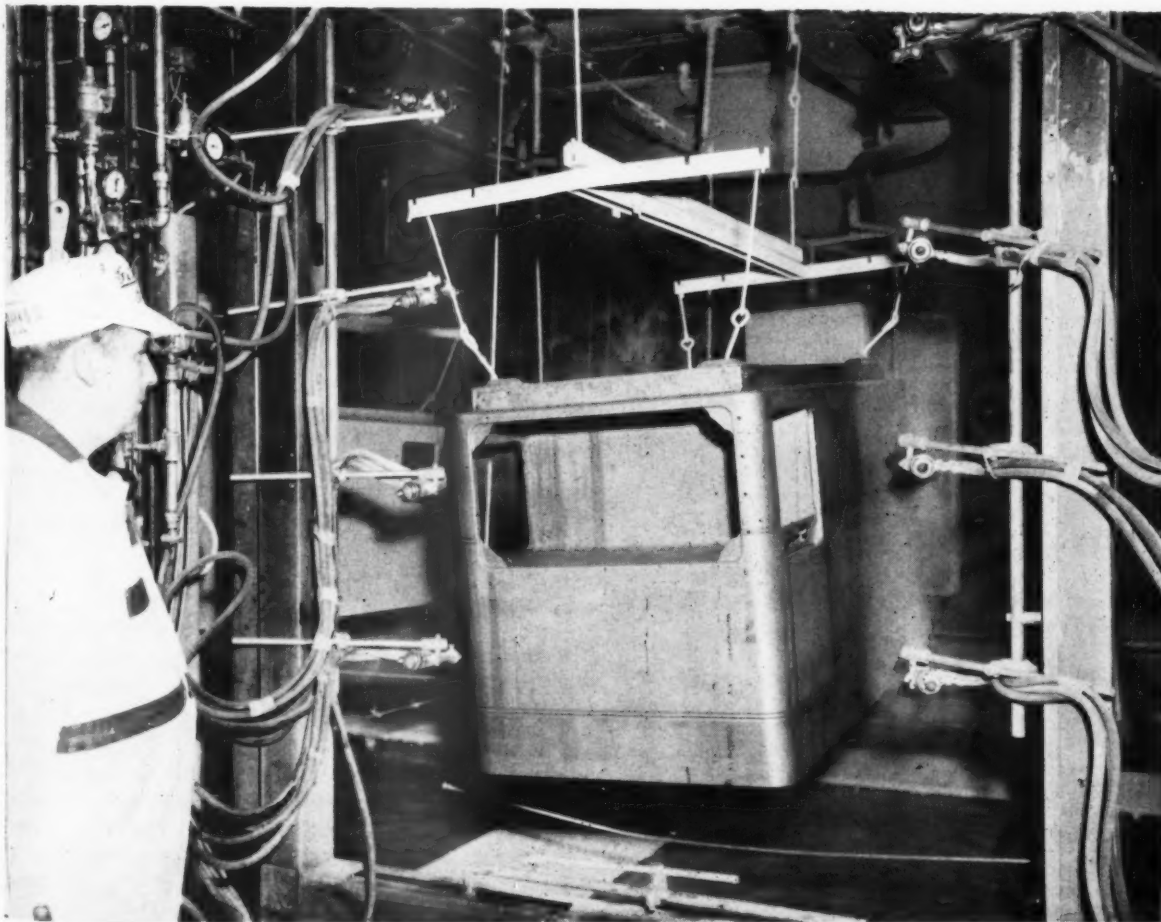
paint application, namely, electrostatic spraying. Through this method much of the manual hand spraying is eliminated by the automatic features of the new process.

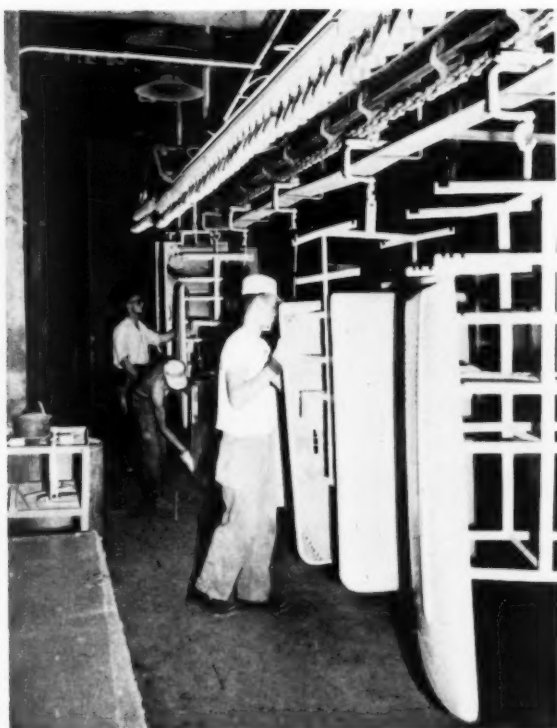
## Improved coating efficiency

Quality and efficiency of operation have marked the electrostatic spray-

ing operation. The most noticeable feature has been in improved coating efficiency, resulting in a substantial paint saving. The labor cost has been reduced through elimination of a number of hand sprayers. Lower reject percentages have made it possible to save labor and material in reworking rejected parts. The me-

*A freezer cabinet is shown being sprayed in its first pass through an electrostatic spray booth.*



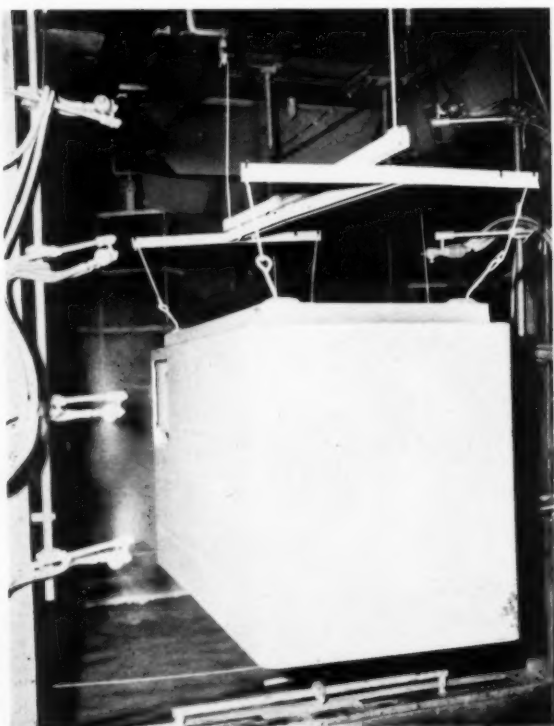


*A group of hand sanders are shown examining ware for any dirt or foreign matter embedded in the prime coat. Dirt is removed by use of a fine grit sandpaper.*

chanical features of the process have given a much more uniform paint thickness than could be applied by hand spraying.

Before we get into a discussion of

the specific details of electrostatic spraying, it may be well to review briefly the entire finishing operation from the time the refrigerator and freezer parts are placed on the con-



*This freezer cabinet has completed the "U" turn and is shown being sprayed in the second pass through the prime coat booth.*

veyor chain until they are received by the plant's assembly department.

### **3000-foot conveyor used**

The new finishing department conveyor is about 50 per cent longer than the old conveyor. The overall length is approximately 3040 feet. It is driven by three synchronized drives. The speed of the chain can be adjusted electrically. The time elapsed between hanging a raw metal part on the conveyor and removing it as a finished painted part is close to three hours.

The finishing operation can be divided into three distinct steps: (1) cleaning and rust-proofing the ware, (2) applying the first (prime) coat to the ware, and (3) applying the finish (synthetic enamel) coat to the ware.

### **Five-stage "washer"**

In the first step, the ware is loaded on hangers on the conveyor and then carried through a five-stage washer unit where separate stages spray the parts through a system of spray nozzles. In the first stage, the metal is cleaned by a hot alkaline spray which removes dirt, oil and grease from surface of the ware. In the second stage, the ware is rinsed clean with fresh, hot water. The parts now enter the third stage where a chemical zinc phosphate coating is deposited on them to make the surface rust-proof. This stage is followed by a cold water rinse and finally an acid rinse which uses a mixture of chromic and phosphoric acid. This acid rinse serves as a safeguard to the rust-proofing by eliminating any harmful salt deposits from the metal surface. The ware is blown off with compressed air to remove excessive moisture and dried off in a gas-heated oven.

### **Application of prime coat**

The metal parts coming from the dry-off oven are now ready for the second step in the finishing operation, the application of the first coat of paint. Before entering the spray booth, the parts are wiped clean with a "tack" rag, a specially treated cloth whose stickiness enables it to pick up lint and dirt from the parts. In the first booth the major portion of the painting is accomplished in two sepa-



rate passes using electrostatic spraying. (This process will be described more completely later in this article.)

The ware then enters another spray booth where hand sprayers finish applying the first coat of paint to the areas where the electrostatic spray cannot reach. The prime-coated ware is then carried through an oven where it is baked at 355° F. for 35 minutes. This baking process results in a smooth, hard coating which adheres tightly to the surface of the metal.

#### Application of finish coat

The conveyor carries the ware from the prime coat oven and it is next prepared for the third and final step in the finishing operation, the application of the finish coat. First a group of hand sanders examine and remove any dirt or foreign matter embedded in the prime coat using a fine grit sandpaper. The sanding dust created by this operation is blown off or vacuum-cleaned, and the parts are "tack-ragged" before entering the finish coat electrostatic spray booth. (This booth is similar to the prime coat booth.) The paint is applied in two separate passes electrostatically. From this booth the ware enters the finish coat, hand touch-up booth where the missed portions are painted. The ware is then baked in an oven at 295° F. for 35 minutes, and, when it emerges from the oven, is inspected and sent to the assembly line. Any rejected pieces are re-worked and sent through the final two steps of the finishing operation again.

#### Electrostatic spraying process

The heart of the finishing system is centered in the prime and finish electrostatic spray booths. This process (see "Electrostatic Spraying Offers New Possibilities for Enamel Application," January 1945 finish) works through the fundamental law of physics that like charges of electricity repel each other and unlike charges attract. In this case the metal parts hanging on the conveyor chain are brought into a strong electrical field where they assume the same electrical charge as the conveyor to which they are connected, this charge being

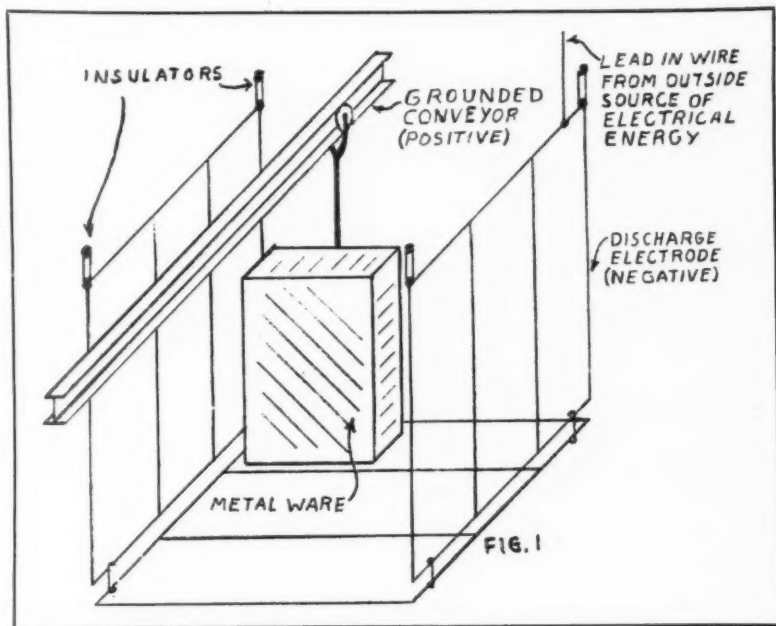


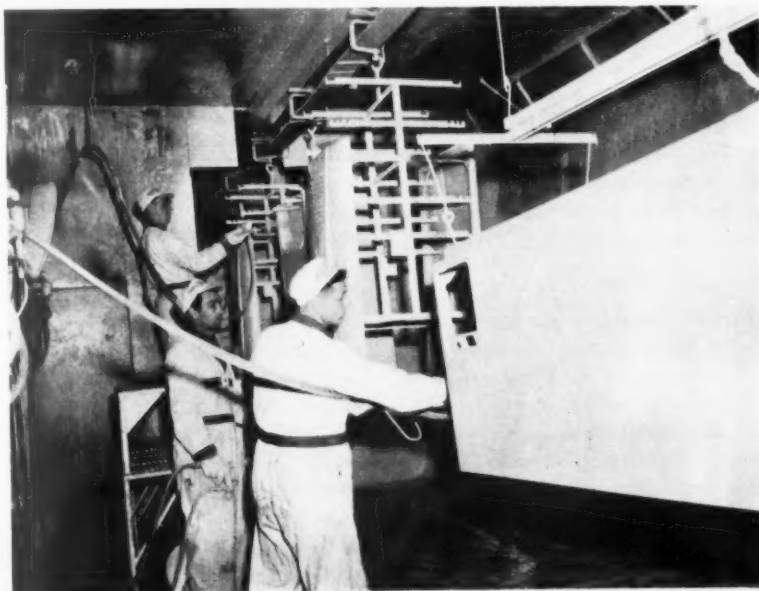
Figure 1 — This diagram shows the construction and electrical principle by which the electrostatic spray process operates.

positive. While the ware is in the field, finely atomized paint particles are sprayed adjacent to the ware and they become charged negatively by the discharge electrodes which surround the conveyor. The electrical attraction between the paint and the ware results in the paint being deposited uniformly over the surface of the metal. The relative positions of the

ware and the discharge electrodes are shown in Figure 1.

The discharge electrodes are steel frames which have been strung with several thin wires and which are connected to an outside source of electrical energy. The energy is obtained by taking ordinary commercial 220 volt AC line voltage and by means of a transformer and rectifying tube

*Hand sprayers are used to apply the synthetic enamel to those portions of the ware which cannot be reached by the electrostatic process.*



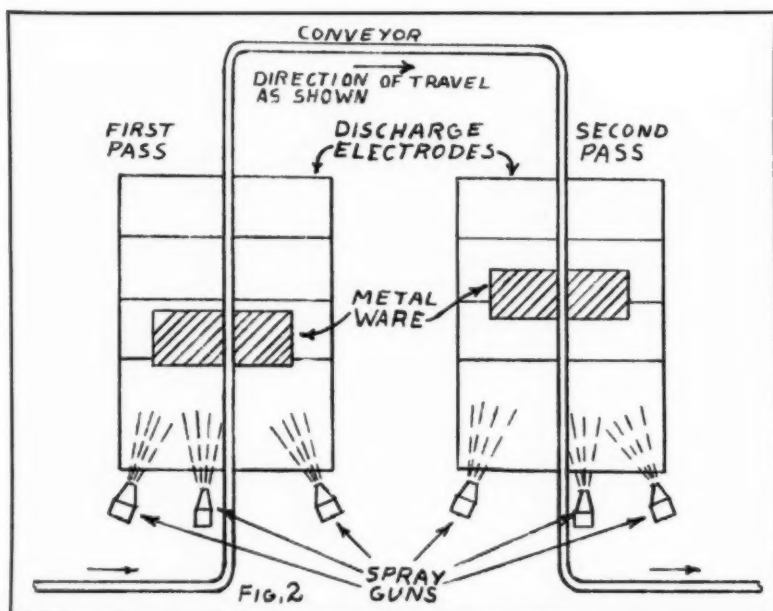


Figure 2 — This diagram shows the position of spray guns, ware, and discharge electrodes. Paint is applied in two separate passes in each booth.

changing the voltage to nearly 120,000 volts and changing the alternating current to direct current. The lead-in wires energize the electrodes with this high voltage (the current is exceedingly small, only about 10 milliamperes), and bring about the strong electrical field which surrounds the ware (shown in Figure 1). These electrodes are positioned about 18" from the ware to be painted.

It has been previously mentioned that the paint was applied in two separate passes in each electrostatic booth. Figure 2 shows the positions of the spray guns, ware and discharge electrodes in the booths during the operation. The conveyor describes a "U" turn in the booth. In the first pass the ware is sprayed as it moves away from the guns while in the second pass it is sprayed as it moves toward the guns.

#### Nine guns operated by one switch

In the spray booth the spray guns operate automatically. Each hanger on the conveyor chain has an arm which trips a switch upon entering the electrostatic field. This switch allows compressed air to open the guns and start spraying. As the hanger leaves the field, it trips another switch which cuts off the guns. As many as nine guns may start

spraying from one switch. The guns are arranged with a set of four on each side of the conveyor and one gun at the bottom and under the conveyor for each pass. These guns are not stationary but reciprocate constantly. The side guns move ver-

#### Russell Wydeen

— was graduated from the University of Minnesota in 1943 with a Bachelor's Degree in Chemical Engineering. He spent 1944 and 1945 with the Navy, serving in the Pacific Theatre. Since joining the Seeger organization in 1946, a great part of which work has been concerned with production control, which includes not only record work but direct control of departmental activities.

tically up and down while the bottom gun moves back and forth horizontally. In this way the paint is applied uniformly. Various combinations of guns may be used for spraying, depending upon the ware to be sprayed. For example, when a cabinet shell is being sprayed, the bottom gun must operate in order to spray the top of the shell (the shell is hung upside down on the conveyor). This bottom gun is not needed when a set of doors and base panels are being sprayed. A different switch is actuated by the

trip arm in this case, and the necessary guns operate.

There are two deviations from hand spraying which are noted. One of the basic laws of good hand spraying is that the gun must be held perpendicular to the ware when spraying. In electrostatic spraying, the gun sprays almost parallel to the ware. The other main difference lies in the reduced air and paint pressures used by the electrostatic method, being considerably lower than those ordinarily employed for hand spraying. These two basic differences make it possible for the electrostatic field to effect uniform deposition on the ware at a high rate of efficiency.

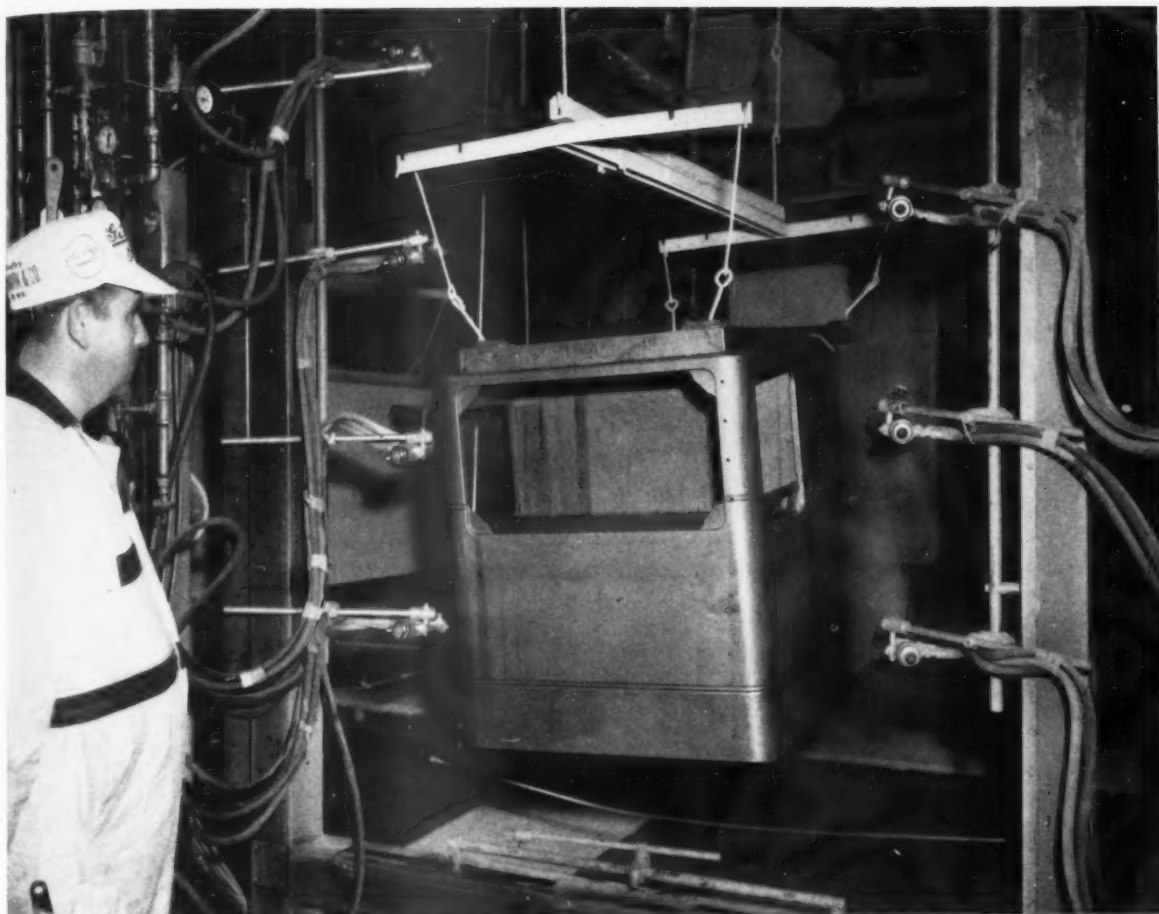
The exhaust air in the spray booth must be controlled at the right speed so the paint is not carried past the ware because of too much air nor allowed to fall downwards because of too little air. There must be no eddying air currents which would tend to work against the electrostatic field and result in too much paint being deposited at one point and not enough at another.

#### Clean air very important

The air must be very clean since the electrostatic attraction acts the same on lint and dirt particles as it does on paint particles, and results in dirty ware if the air is not clean. In order to insure clean air in the booth the air is first filtered through plastic filters, pre-heated, washed in a water wash, heated, passed through an oil filter, sent to the spray booth and once again filtered through plastic filters. The temperature of the air is thermostatically controlled.

The new paint shop has other features which make it an outstanding example of a modern finishing department. The rework room where rejected parts are repaired is separated from the rest of the paint shop, thereby preventing sanding dirt from getting into the air near the spray booths. The dry-off, prime and finish coat ovens are automatic, direct-fired ovens which can operate on either gas or oil. The spray booths are all of the water-wash variety. All these features go to make up a model paint shop.

## Another Ransburg Electrostatic Spray Application



*Freezer cabinet passing through prime spray booth.*

### **...a better finish at lower cost**

Refrigerators and home freezers now rolling off this assembly line have a new look! The film thickness is more uniform. There are fewer rejects. And, due to savings in paint and labor, finishing costs are considerably less than with former hand spray methods.

Credit for this is given to the complete modernization of the finishing department, and installation of the Ransburg Electrostatic Spray Process.

The Ransburg Process is employed by leading manufacturers on a wide variety of products. They report faster production, higher quality—

and savings in paint, labor, floor space, and overhead.

If you are interested in a better finish at lower cost, check with Ransburg today! Write for illustrated booklet, and for data on applications in your own field. Or, better still, let Ransburg test-coat your product electrostatically in its laboratory, where your production conditions can be closely simulated.

**RANSBURG**

RANSBURG ELECTRO-COATING CORP. • 1234 BARTH, INDIANAPOLIS 7, INDIANA

Half of this message has to do with FLUID-FILM  
—the all-purpose die lubricant for deep drawing which is:

- ... a non-pigment, semi-emulsion
- ... non-corrosive to die or metal
- ... applied by brush, roller, dip or spray
- ... readily cleanable

FLUID-FILM may be used on all types of metal, performing the toughest job economically—a little going a long way. And you can weld through it. . . .

**HALF**

*fluid-film*

*the other*

**HALF**

The other half of our activity is concerned with the removal of FLUID-FILM and any other kind of soil from all types of metal. Whether the process used is spray or immersion cleaning—we have the products that will do the job perfectly—and at low cost. Let our technicians consult with you on your drawing and cleaning problems. You'll find it pays.

*the Whole . . .*

story is that it makes sense to have the same company who supplies the correct lubricants for drawing metals, also provide the material for making it chemically clean afterward.



**NORTHWEST CHEMICAL CO.**  
9310 ROSELAWN DETROIT 4, MICH.



... serving you since

'32



# A model machine shop for research laboratories

**this shop has effectively specialized metal working to serve  
large scale experimental and related programs**

THE spectacular growth of industrial research during the past few years has made necessary the enlargement of many laboratory metal working shops. An excellent example is represented by the modern machine shop of Gulf Oil Corporation's research laboratories, at Har-marville, Pennsylvania.

## Dual function

Planned to function 100% as a "tool" for the oil firm's research and exploratory work, the shop is supplying all metal-working requirements of the laboratories' staff of chemists, physicists, and engineers. It also produces most of the parts required for geophysical prospecting equipment made by Gulf and used in its exploration activities throughout the world.

By the very nature of the work, a great many of the parts specified by Gulf's research staff cannot be obtained in the open market. Requests usually are for "one-of-an-item" parts which can be made under closer supervision of the designer and frequently more quickly than were the work to be given to job shops. Rarely are jobs let to outside suppliers; in instances when this has been done, it has been during periods when the shop was filled with work and a part or entire unit has been needed urgently.

## From clocks to harvesters

Products of the Gulf shop probably are more diversified than those of any similar shop. They range from clocks for bottom hole pressure gages used in oil well drilling and production, to harvesters used to gather pyrethrum daisies for use in the Company's insecticides. Almost common-

place are such jobs as the grinding of crankshafts and the making of complete units or experimental parts for gyroscopes, high altitude airplane engine pumps, oil well drills, various gages, rolling ball viscometers, and a chassis dynamometer.

Among notable "firsts" credited to

this shop are the airborne magnetometer, used in geophysical prospecting; Azon and Razon bombs, guided missiles developed for the last war; and marsh buggies capable of traveling on hard land, in mud, or in water, and also employed in oil exploration work in Louisiana and

*Tool racks at all milling machines in the Gulf Research lab help deliver finished work in minimum time by eliminating trips to the tool room. Racks carry cutters, parallels, chucks, and all milling machine accessories.*





*Plating shop off main floor of machine shop was designed by laboratory engineers. Copper, nickel, chrome, silver, gold, cadmium, lead, tin and indium are used for plating in the four-gallon baths. Blower vent system carries off fumes from baths.*

Texas. Continuing this impressive list is a percussion drill, the modern prospecting gravimeter, and a two-cylinder test engine.

Another important role of the shop is that of testing cutting and grinding oils. Products developed by the laboratories' Lubrication Division are evaluated here in both normal and special test machining operations.

Operators who do such test work are especially trained as both machinists and oil test men, and all evaluations are run under the supervision of lubrication research engineers.

#### **Equipment and facilities**

The Gulf machine shop has 18,479 square feet of floor space. The main shop and assembly floor occupies

*A separate grinding room with sound-proofed ceiling contributes to the quietness of the Gulf Research machine shop. Here, besides grinding operations required on shop work, constant testing of grinding oils is conducted.*



10,676 feet, while storage space in the basement and mezzanine consumes slightly more than 2500 square feet. Supervisory offices and supplementary rooms occupy the remainder. The supervisory offices, along the building's south wall, are linked together with an intercommunication system that also is connected with the desks of the various foremen in the shop proper.

A grinding room, where a large part of the laboratories' testing of thread-grinding oils is conducted, is partially sound-proofed, and is included in the row of special shops. Next to it, in turn, is a paint shop with explosion-proof fixtures and a high-suction spray booth. The electroplating room, of original design, is a model of efficiency and has a tile floor, a blower vent system for removing fumes, and suitable baths for copper-, nickel-, chrome-, silver-, gold-, cadmium-, lead-, tin-, and indium-plating.

Welding and sheet metal work, including the manufacture of special truck bodies needed for seismograph operations, is carried out in another sound-proof room, next to the assembly bay. All inspections are made in air-conditioned, temperature-controlled quarters equipped with a comparator, an electro-limit gage, a super micrometer, and a jeweler's bench and tools. The stock room carries some 2600 different items, ranging from waxed paper to steel bars measuring six inches in diameter.

In the center of the shop floor, located so as not to block vision, is the tool cage. Near the supervisor's office, a library table is provided for the men and all metal-working and other publications of interest to such craftsmen are available.

The metal-working machines of the shop include 24 lathes, 13 milling machines, 6 presses, 12 grinders, a thread grinder, 9 vertical drills, a planer, 2 shapers, a gear shaper, a horizontal-boring machine, a jig borer, an engraving machine, a nibbling machine, a spot welder, 2 arc welding units, 2 power shears, a brake, 5 metal saws, and miscellaneous small machine tools.

Between 3000 and 4000 jobs are

turned out in this shop in the course of a year. A few of these require but half an hour or less for completion, but some of the larger and more involved assignments will require several thousand hours of machining, assembly, inspection, and testing.

#### Basic policies

The shop is operated as a responsibility of R. J. S. Pigott, director of the engineering division. It is under the immediate supervision of F. F. Versaw, superintendent. The basic policies responsible for its performance and efficiency have evolved as a result of trial and development since this type of work first was started at the laboratories in 1929. Briefly, these policies may be summarized as exact time and cost accounting, careful selection and training of research mechanics, best working conditions in every respect, and tooling and organization of the shop to ideally serve its specific function.

#### Centralization

Centralization, or the grouping under one roof of all shop and allied services such as welding, painting, etc., is considered a major advantage over having individual and smaller shops assigned to laboratory departments. Studies proved to the Gulf management that the splitting of functions results in duplication, lost time, and inability to operate all facilities with maximum efficiency. Unification has eliminated these wasteful practices.

The shop floor proper has been arranged into three units of machines and benches. Each unit is similarly equipped and virtually is a complete shop in itself. Thus, on any job, the machinists are only a few steps from their benches to any machine they might need.

#### Records

The cost and accounting systems used in the machine shop of the Research Laboratories are completely detailed. A record for each job—no matter how small—shows total hours, the time the various machines used were operated, and the quantities and prices of material required. Each completed job cost is checked against



*Inspection work is conducted in this air and temperature-controlled room off the main work floor. It is equipped with all modern gage instruments (many made in the shop), comparator, electrolimit gage, profilometer, jeweler's bench and tools.*

the estimate and any notable discrepancies are investigated. So complete are the records that each hour of every man and machine can be traced for the past seven years.

Probably more valuable than any other single factor is the ability of the shop to render fast service. Although months may be necessary for the concept of a new research de-

velopment, it almost invariably comes to the shop as a hurry-up job. Certain small items frequently can be placed in the user's hands in a matter of hours, and almost all products can be turned out in substantially less time than if procured outside. Personal supervision and consultation by the scientist who has asked that a job be done eliminates con-

*Located off the assembly bay of the machine shop, this sheet metal and welding room is sound-proofed to eliminate excessive noise on the main floor. Special truck bodies and storage tanks are among the hundreds of items fabricated here.*







*Products displayed on the table illustrate the diversified work of the shop. Two men are shown examining a bomb-like "bird" used in aerial oil prospecting. Forest F. Versaw, second from left, is superintendent of the shop.*

siderable delay, and time so gained for any research program is invaluable.

Obviously mechanics with specialized ability are necessary for the type of work done in this shop. The experimental field is relatively narrow and men with the desired training and experience are so difficult to find that the laboratory has developed a

program of training. Each selected trainee serves a 10,000 hour apprenticeship during which he does all types of work under the supervision and guidance of an expert craftsman. When his course is completed, he is a full-fledged journeyman schooled in all phases of his craft.

One reason for such intensive training is that the Gulf shop does not

*Looking down the main floor of the machine shop. Glassed-in rooms are clerical office, inspection shop, grinding room, paint shop, plating shop, and stock room. Most machines face same way to facilitate supervision and enhance orderliness.*



employ men who are solely machine operators or bench operators. Each worker must have a high degree of initiative and is charged with the responsibility of carrying his assignments through all operations to final completion. For the most part, the men do their own inspecting with the duties of the shop inspection staff being confined primarily to the checking of incoming materials and equipment or outgoing jobs that have been ordered by divisions of Gulf other than the laboratory.

The fact that the present staff of 90 men is engaged primarily on cre-

#### **Editor's Note:**

Only the larger companies could logically support the complete facilities described in this article. There are, however, many details of interest which can logically be employed by manufacturing companies of any size.

ative projects, to which their own resourcefulness contributes, increases job interest. Each is aware that he is working in the foreground of science—and is proud of it!

#### **Working conditions**

A pleasant and work-conducive atmosphere is provided. Sound-proofing of welding, grinding, and sheet-metal operations has reduced noise. Blasts of hot air during the winter season have been eliminated by monitor heating and wall radiators, with vents directed to the ceiling.

Ideal daylight is provided by windows rising from bench level to ceiling on main floor and the entire height of the monitor section. To avoid sun glare and summer heat, all work benches have been placed on the shady side of the structure. Any artificial illumination that is required is provided by fluorescents.

The interior side walls are painted with two shades of green, while the end walls are of yellow. All hazards, including the overhead crane, are bright yellow. Lathes and other machines have been painted horizon gray or spotlight buff, and most face the same direction to facilitate supervision and enhance orderliness.





*The Greenbrier, White Sulphur Springs, W. Va., scene of the annual meeting of the Porcelain Enamel Institute.*

## Porcelain Enamel Institute holds 19th annual meeting

THE 19th annual meeting of the Porcelain Enamel Institute was held at The Greenbrier, White Sulphur Springs, West Virginia, October 31 and November 1 and 2. An extensive series of business sessions included meetings of the Executive Committee, the Board of Trustees, and four of the active divisions of the PEI (Architectural Division, Sign Division, Table Top Division, and Steel Plumbing Fixtures Division). General meetings of the group included special luncheons, a banquet Wednesday evening, November 1, and a morning session on Thursday devoted to the subject of national defense. Many of those in attendance managed to find time for golf, horseback riding, and other sports readily available at The Greenbrier.

### Dadisman heads new slate

R. A. Dadisman, Armco Steel Corporation, was elected president of PEI for the coming year. Four vice presidents were re-elected: W. A. Barrows,

Barrows Porcelain Enamel Company, Cincinnati, Ohio; T. G. Harris, Porcelain Steel Corporation, Con-



PRESIDENT DADISMAN

nersville, Indiana; J. H. E. McMillan, Ingram-Richardson Manufacturing Company, Beaver Falls, Pennsylvania; and J. T. Penton, California Metal Enameling Company, Los Angeles, California. Two newly elect-

ed vice presidents are E. M. Hommel, The O. Hommel Company, Pittsburgh, Pennsylvania, and H. H. Wineburgh, Texlite, Inc., Dallas, Texas.

Re-elected were Treasurer P. B. McBride, Porcelain Metals Corporation of Louisville, Kentucky, and Secretary Edward Mackasek, PEI managing director.

The number of trustees has been increased from 25 to 28, which provides for representation of four trustees for the Steel Plumbing Fixtures Division, as in the case of the other active divisions of the Institute. Newly elected trustees for this division include: F. H. Bechill, Kaiser Metal Products Inc., Bristol, Pennsylvania; H. M. Strong, The Murray Corporation of America, Scranton, Pennsylvania; and H. W. Butterfield, Norris Stamping & Manufacturing Company, Los Angeles, California. Four additional changes were made in the Board, the following being the newly elected members: Robert C. Myers, Carnegie-Illinois Steel Corporation, Pittsburgh,



Clockwise: Mrs. Elsie Miller, PEI; Mr. & Mrs. H. W. Butterfield, Norris Stmpg.; Mrs. Williams; Mr. & Mrs. W. H. Brett and Mr. & Mrs. C. J. Rodman, AllianceWare; Mrs. Spencer, H. R. Spencer, Erie Enameling; Howard Williams, Pemco.

L. S. Hamaker, Republic Steel; Mrs. Hommel, E. H. Hommel, O. Hommel Co.; W. H. Lowry, Vitreous Steel; W. K. Burriss, Indus. Pub.; Mrs. Barrows, W. A. Barrows, Barrows Porcelain; Mrs. Longwell, Burton Longwell, Republic Steel; Mrs. Hamaker.



Frank Monaco (light suit), restaurateur; R. M. Curts, American Potash & Chemical; Mrs. Wineburg, H. H. Wineburg, Textlite; Mr. & Mrs. Russell Greer, Pemco; Mrs. H. Turk, Herbert Turk, Pemco; J. F. Matejczyk and Shipp Davis, of O. Hommel.

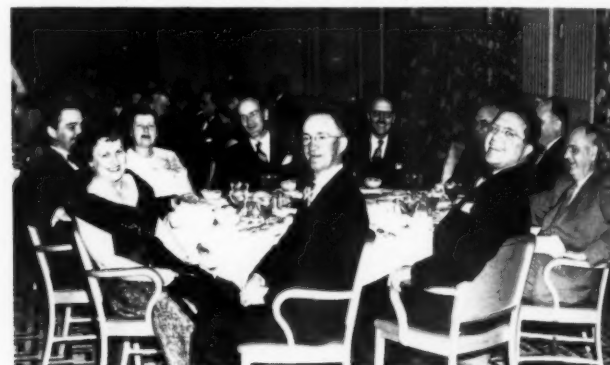


C. A. Morrow, Youngstown Kitchens; R. C. Myers, Carnegie-Illinois; John Oliver, PEI; E. O. Brady, Wm. Muir, Briggs Mfg.



M. E. VanderKloet, Erie Enameling; Mrs. Holcomb; R. H. Coin, Ing-Rich; Mrs. Vicary; Jim Holcomb, Wolverine Porcelain; Mrs. Coin; Jess Salton, Seaporcel; Mrs. VanderKloet; J. W. Vicary, Ervite; and Mrs. Salton.

Mrs. Chase, Dana Chase, finish; Mrs. Smith, R. N. Smith, Temco; F. C. Woleslagle, Carnegie-Illinois; Edgar Weil, Vitreous Steel; Don Malcom, Armco; Frank Thomas, Porcelain Steel; Glenn Hutt, Ferro Enamel; Ted Harris, Porcelain Steel.



Mrs. Johnston; J. H. E. McMillan, Ing-Rich; R. B. Johnston, Ellwood Iron; M. H. Pickard, P. C. Borax; Fred Shaw, Bettinger; Mrs. Hart; P. B. McBride, Porcelain Metals; Don Hart, Temco; Bill Wenning, Ceramic Color; D. C. MacDonald, Industrial News.



Mrs. Donald Hagner; Mr. & Mrs. Richard Turk, Pemco Corporation; Donald F. Hagner, Federal Reserve Bank of Baltimore.



At speaker's table at annual banquet: C. D. Clawson, past pres.; Wm. Hogenson, past treas.; F. L. Meacham, retiring pres.; Ray Dadisman, incoming pres.; Dr. Murray Banks, guest speaker; and Edw. Mackasek, PEI managing director.



Pennsylvania (Cooperating Division); A. S. Ault, Chicago Vitreous Enamel Product Company, Cicero, Illinois (Frit Division); H. H. Wineburgh, Texlite, Inc., Dallas, Texas (Sign Division); and T. E. Stokes, Clyde Porcelain Steel Corporation, Clyde, Ohio (Table Top Division).

President Dadisman has been serving as vice president of the PEI, and has for a number of years been very active on some of the most important committees of the Institute. In his acceptance speech he gave generous credit to the close cooperation of committee members for the results that have been obtained to date. He pledged his best efforts "to keep the Institute moving forward."

#### **\$50,000 fund pledged by Architectural Division**

Announcement was made, during the annual meeting, that the \$50,000 fund being raised by the Architectural Division for its "Curtain Wall Project" (see "\$50,000 Curtain Wall Research Program Approved," June 1950 finish) has been completely pledged. The first part of the program as planned, including research and development work, is to be started upon completion of the fund-raising campaign.

A new importance is to be placed on standard specifications by this group. A technical committee is also to be appointed, to propose recommended standard details relating to construction practice, particularly in

relation to filling stations. Further study on calking compounds is also in the wind.

J. A. Holcomb is chairman of the Architectural group, with Leonard Nachman, sub-chairman.

#### **Cooperative sign exhibit planned**

The Sign Division, headed by W. A. Barrows, is planning to again sponsor a cooperative exhibit at the National Electric Sign Association

to Page 54 →

#### **PEI Board of Trustees for 1951**

##### **Architectural Division**

W. A. Barrows, Barrows Porcelain Enamel Co.  
J. A. Holcomb, Wolverine Porcelain Enameling Co.  
M. J. Salton, Seaporcel Metals, Inc.  
H. R. Spencer, Erie Enameling Company

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Dana Chase, Dana Chase Publications  
R. A. Dadisman, Armco Steel Corporation  
Robert C. Myers, Carnegie-Illinois Steel Corporation  
W. F. Wenning, Ceramic Color & Chemical Mfg. Co.

##### **Frit Division**

A. S. Ault, Chicago Vitreous Enamel Product Co.  
C. D. Clawson, Ferro Enamel Corporation  
E. M. Hommel, The O. Hommel Company  
H. Turk, Pemco Corporation

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E. P. Calkins, General Porcelain Enameling & Mfg. Co.  
T. G. Harris, Porcelain Steel Corp.

P. B. McBride, Porcelain Metals Corp.

E. L. Seasholtz, J. M. Seasholtz & Sons, Inc.

##### **Sign Division**

J. H. E. McMillan, Ingram-Richardson Mfg. Co.  
J. T. Penton, California Metal Enameling Co.  
R. A. Weaver, Jr., Bettinger Enamel Corporation  
H. H. Wineburgh, Texlite, Inc.

##### **Table Top Division**

R. H. Coin, Ingram-Richardson Mfg. Co. of Indiana, Inc.  
B. Dyer, Vitreous Steel Products Company  
F. D. Hart, Temco, Inc.  
T. E. Stokes, Clyde Porcelain Steel Corp.

##### **Steel Plumbing Fixtures Div.**

E. O. Brady, Briggs Manufacturing Co.  
F. H. Bechill, Kaiser Metal Products, Inc.  
H. M. Strong, Murray Corporation of America  
H. W. Butterfield, Norris Stamping & Mfg. Co.





*Lighter-Stronger*

# The WATKINS

## Some advantages of the

1. The container is a traveling billboard — product story on one or all of the four sides.
2. It is light in weight — weight saving in practically every case when compared to open-type crates.
3. It saves packing time — it reaches the destination faster.
4. It saves storage space — complete protection in transit and storage space.
5. It has extra strength — superior carrying strength, it will also carry more than open-type crates.

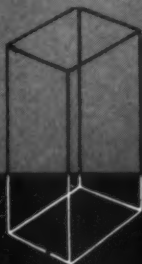
## Some products that ship better in WATKINS containers

Watkins Containers save time in the shipping department; give better protection in transit. Major appliances and any other similar products that can be shipped in a wooden crate can be shipped better in this container. Weights up to 800 pounds are being shipped. Here are just a few of the products that can be shipped to advantage in WATKINS CONTAINERS.

Washing Machines  
Refrigerators  
Ironers  
Storage Water Tanks  
Steel Kitchen Cabinets

Air Conditioners  
Unit Heaters  
Sinks  
Pumps  
Water Softeners  
Furniture

Gas and Electric Ranges  
Oil Burners  
Caskets  
Stoves  
Radio and Television Sets



# The WATKINS CONTAINER



# KINS CRATE

## of the WATKINS container

g billboard—2 color printing tells your prod-  
the four sides of the container.

ht saving up to several pounds can be made  
when converting from conventional crates.

reaches the user 75% assembled.

—completely collapsible, it saves shipping  
age space in the plant.

uperior to ordinary containers in product  
also carry more top load and resist "weave"  
ates.

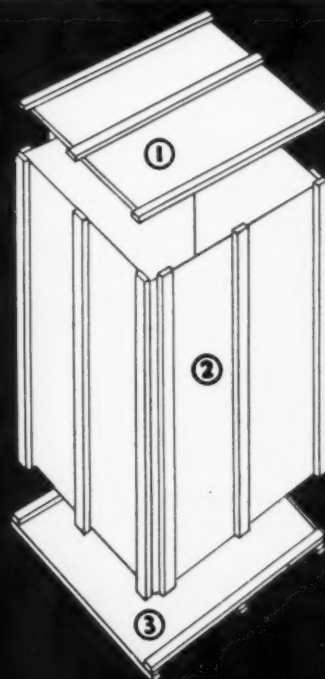
### These companies build WATKINS containers

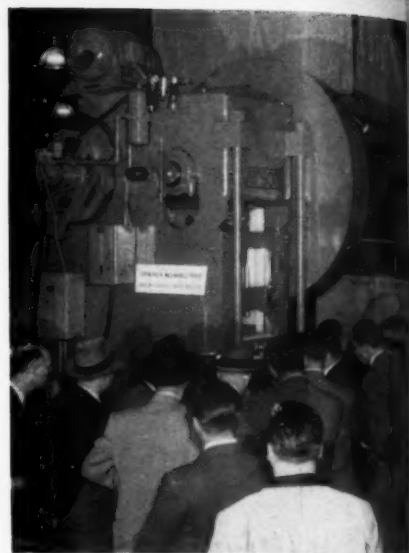
Cornell Wood Products Co., Hummel & Downing Division	1514 E. Thomas Ave., Milwaukee, Wisconsin
Coxier Container Corp.	446 E. 131st St., Cleveland, Ohio
Crate-Rite Mfg. Corp., Div. of Pacific Ports Ind. Inc.	10901 Russel St., Oakland, California
Duro-Crates Co.	940 E. Michigan St., Indianapolis, Indiana
General Box Co.	500 N. Dearborn St., Chicago, Illinois, and 16th and Maple Sts., Louisville, Kentucky
Homb & Martin Mfg. Co.	115 Cherry St., Waukegan, Illinois
Illinois Box & Crate Co.	811 Center St., Plainfield, Illinois
Kieckhefer Box & Lumber Co.	714 E. Canal St., Milwaukee, Wisconsin
Lana Container Corp.	10212 Denton Rd., Dallas, Texas
Lewisburg Container Co.	243 Singer St., Lewisburg, Ohio
Love Mfg. Inc.	608 S. Commerce St., Wichita, Kansas

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## 1950 NATIONAL METAL EXPOSITION

The photos on these two pages show a few of the 360 exhibits at the National Metal Exposition, held in Chicago's International Amphitheatre, October 23-27.

The "biggest show on earth" was held in conjunction with the 32nd annual convention of the National Metal Congress which was sponsored by the following technical societies: American

*Above left: Tinnerman featured "savings stories" with their line of fasteners.*

*Upper center: Jensen Specialties showed new radiant heater panels, and bar-type conveyors.*

*Lower center: Pressed Metal Institute booth display stressed "Advance with Stampings."*

*Below left: Udylite had on display a large, fully automatic plating machine.*

*Below: L. R. Kerns featured industrial lubricants, including drawing compounds.*

finishfotos





## METAL EXPOSITION

Society for Metals; American Welding Society; Institute of Metals Division, American Institute of Mining and Metallurgical Engineers; and Society for Non-Destructive Testing.

In addition, more than 200 technical papers were presented at the various society meetings held daily at the Palmer House, Hotel Sherman, Hotel Sheraton, and Morrison Hotel.

*Above center: In Vernon's booth, a press stamped out souvenir ash trays.*

*Above right: Shown is small corner of International Nickel's huge exhibit.*

*Upper center: Heat treating, finish & core baking were Despatch Oven's theme.*

*Lower center: Acme-Morrison's metal stitcher drew attention of fabricators.*

*Lower right: Detrex exhibit was highlighted by automatic degreasing unit.*

*Below: Brown Instrument displayed a line of electronic control equipment.*

finishfotos





# 6

## Reasons Why More and More Appliance Manufacturers Are Moving to

# The Merchandise Mart

THE SHOW PLACE OF AMERICA'S BEST-KNOWN BRANDS

### 52-Week Market Center

Showrooms in The Mart are open every day, every week of the year. Because of this, huge numbers of buyers come to it throughout the year, not only at the regular market times.

### All on One Floor Office Space

Entire companies can be housed on *one* floor at The Mart, saving much time and expense. Space can be divided and developed to suit your exact needs.

### Showrooms Tailored to Your Specifications

The clean, dazzling showrooms of The Mart and the famous manufacturers who display lines in them have earned The Mart the name, "Show Place of America's Best-Known Brands." Smart, individual decoration and lighting dramatize each showroom to utmost advantage.

### Easily Reached Location

The Mart is set away from the congested Loop area, and yet it affords exceptionally fine transportation. The North Shore and Elevated stations are on the 2nd floor of The Mart itself—4 bus lines, 2 trolley lines make travel to and from The Mart easy from any place in greater Chicago.



### Air-Conditioning

The Mart's huge air-conditioning plant makes individual air-conditioning installation simple and economical. 65% of the building is now air-conditioned the year 'round.

### Fine Parking and Service Facilities

The Mart maintains its own parking lot in addition to 3 commercially owned lots within a block. 11 restaurants, 24 other retail shops, bank, post office, barber, doctor, dentist and florist are just a few of the many other services that make The Mart "a city within a city" for the 20,000 people who work there in quiet, air-conditioned comfort.

**for further details, write:**

**General Manager  
Office of the Building  
The Merchandise Mart  
Chicago 54, Illinois**

DECEMBER • 1950 finish



# NEWS

## LANDERS, FRARY & CLARK WIN PRODUCT DESIGN AWARD

In the 12th annual "Electrical Manufacturing" Products Design Awards Competition, sponsored by the publishers of *Electrical Merchandising*, Landers, Frary & Clark, of New Britain, Connecticut, were cited for "outstanding achievement in the development of the sectional-type electric range." (Their new sectional-type Universal range was shown in April 1950 *finish*.)

## PLAN 1951 U. S. TRADE FAIR

Officials of the First United States International Trade Fair, held in Chicago during August, are now formulating plans for a 1951 Fair to be held in Chicago. The date of next year's fair has been set for September 8 through 23.

## EXPANDING SMOKELESS COAL HEATER PRODUCTION

Because of the "outstanding performance" of their smokeless coal burning heaters last winter, Martin Stove and Range Company, of Florence, Alabama, has announced that it is expanding production on two models in the 40,000 Btu size. It was stated that last year's purchasers of the heaters reported fuel savings of 25 per cent.

Smokeless coal burning heaters are manufactured according to the principles of smokeless combustion de-

veloped by Bituminous Coal Research, Inc., the national research agency of the bituminous coal industry (see "Cooperative Research Effort Results in Production of Smokeless Coal Heater," May 1948 *finish*).

## RHEEM ANNOUNCES PLANS TO PRODUCE GAS REFRIGERATOR

R. S. Rheem, president of Rheem Manufacturing Company, has announced that his firm is preparing to produce and market a new gas-absorption type of household refrigerator.

Developed by Clayton & Lambert Mfg. Co., of Louisville, the refrigerator will be made by Rheem under an agreement just concluded between the two companies.

In the process of development and testing for more than five years, the new refrigerator will be available in popular capacities, and will be sold under the Rheem name.

"The decision to produce this completely new gas refrigerator is another indication of our unbounded faith in the future of gas as the popular household fuel," said Mr. Rheem. The company also manufactures a complete line of gas-fired water heaters and heating equipment.

## BATHTUB, SINK PRODUCTION BOTH TO PASS 2 MILLION MARK

Production of bathtubs in the United States in 1950 will exceed two million units for the first time in history, the Plumbing and Heating

Industries Bureau predicts. This forecast is based on the assumption that a high rate of output would be maintained until the end of the year.

Kitchen sinks are also expected to reach a total of about 2,500,000 units by the end of this year, said a Bureau spokesman.

## MANWARING TO IES POST

A. H. Manwaring, executive vice president of Philadelphia Electrical and Manufacturing Co., manufacturers of electric water heaters and street lighting equipment, has been named general secretary of the Illuminating Engineering Society at the IES 1950 conference held recently in Pasadena, Calif.

## CHAMBERS REPORTS SWING TO COLORED RANGES

More than 31% of the ranges sold by Chambers Corporation, Shelbyville, Indiana, during the past 12 months have been in pastel tones, according to a Chambers announcement.

A sales survey by the company, which introduced ranges in a variety of colors two years ago, shows that dealers from coast-to-coast are finding the new hues growing in demand.

A. H. Scheffer, Chambers sales manager pointed out that the firm conducted extensive research into the use of color in kitchens, and developed a "new concept of pleasant living"—cooking equipment in colors. "That our findings were correct is evidenced in sales figures for the past year," said Scheffer.

In addition to traditional white ranges, Chambers now manufactures units in pastel yellow, blue, green, red, and grey.

## KITCHEN CABINET INSTITUTE ANNUAL MEETING, FEBRUARY 14

The 1951 annual meeting of the Steel Kitchen Cabinet Institute has been set for February 14, the place to be announced later, according to E. E. Brey, Institute president.

"The Institute feels that keeping in close touch with developments in the Washington picture and being

# This Area is IMPORTANT TOO!



## NAGEL-CHASE V-BELT PULLEYS

V-belt pulleys have never been a "side-line" with Nagel-Chase. Instead, as one of the leading manufacturers of pulleys for all purposes, Nagel-Chase is equipped to produce fractional horse power types ideally suited to wringer and automatic washing machines and dryers.

Made of spot-welded pressed steel, with rolled or flanged edge, they are available in sizes from 2 5/16" to 14", with hubs in sizes to fit any standard motor shaft.

Hubs are "milled from the bar" with a flat surface on one side which fits over the D-shaped hole on the pulley so that it cannot turn on the hub.

Find out how you can cut your pulley costs. Send today for complete information on Nagel-Chase V-Belt Pulleys!

## LEADING APPLIANCES ROLL on NAGEL-CHASE CASTERS

Often the maneuverability of a washing machine or ironer determines its selection by a buyer. And because Nagel-Chase Casters are precision built to turn at the slightest pressure — allowing the maximum in maneuverability — they have been preferred by leading appliance manufacturers for over 25 years.

Your caster requirements, too, can be met dependably and economically by the Nagel-Chase line. It includes Pintle and Swivel types, with or without ball bearings, in several different fork designs, and with the efficient Nagel-Chase cam brake.

Wheels are available in 3 sizes: 1 3/8", 2", and 2 1/2", made of wear-resisting plastic, hard rubber composition, or soft tread rubber composition.

Detailed information on Nagel-Chase Casters will be sent free on request. Write, wire or phone today.



**THE NAGEL-CHASE MANUFACTURING COMPANY**  
2811 N. Ashland Avenue, Chicago 13, Ill.  
SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!

fully prepared and ready to take action in any desired direction is just good foresight and will insure the best assistance possible to the country in connection with any emergency as well as provide the largest quantity of necessary materials to manufacturers of steel cabinets," said Brey, who is also assistant to the president of Acme Metal Products Corp.

"The selection of a location for

the February 14, 1951 annual meeting of the Steel Kitchen Cabinet Institute is being intentionally deferred so that developments, as they transpire, can be taken into account to insure a city, such as Washington, D. C., which will more easily facilitate handling of whatever situation is confronting at that time," stated Brey.

## NESCO ENTERS COMMERCIAL FRIT FIELD

The formation of a new division to manufacture and sell a line of commercial frit—the raw material for making porcelain enamel—has been announced by William Howlett, executive vice president, Nesco, Inc.

Howlett said that Nesco will produce and nationally merchandise the frit from its Granite City, Illinois, plant, and will make available to industry a complete research and development service to find new uses and markets for products made from the compound.

In addition to selling frit commercially, Howlett said that Nesco will replace its previously unprofitable enamel cooking ware business with a new line of unique enameled specialties. The company will con-

tinue to use its enamel facilities for its line of electrical appliances, including new electric roaster models. He explained that capacity at the Granite City plant is large enough to accommodate a sizable commercial operation in addition to producing enough frit for regular company uses.

The firm will shortly appoint a national sales manager to handle merchandising of its commercial frit supply, and also a director of porcelain enamel research, stated Howlett.

Nesco has manufactured frit for its housewares division since 1880, and is one of the nation's oldest producers. Howlett said that the firm's long experience in the field should enable it to be of great service to other frit users.

## FERRO OPENS NEW PORCELAIN ENAMEL CONTEST FOR STUDENTS

A new Student Competition in Porcelain Enameling has been announced by Ferro Enamel Corporation "in order to contribute to greater consciousness in ceramic education."

The 1951 competition is open to students, both graduate and undergraduate, in ceramic schools in the United States and Canada. First prize will be for \$500; second, \$300; third, \$100; fourth and fifth, \$50 each. The prizes will be awarded for the best papers dealing with any phase of porcelain enameling technology.

Entry blanks must be submitted by January 15; the contest closes March 16. Prizes will be awarded at the 53rd annual meeting of the American

Ceramic Society, April 22-26, in Chicago.

Judges will be Charles S. Pearce, secretary, American Ceramic Society; Edward Mackasek, managing director, Porcelain Enamel Institute; and Dr. G. H. McIntyre, vice president and director of research, Ferro Enamel Corporation.

In announcing the 1951 contest, Dr. McIntyre stated that the judges and his company were very pleased with the results of last year's Ferro competition. He added that all contributions were exceedingly high in quality and that wide interest was created by the effort.

Students wishing to enter the Ferro contest may contact the head of the Ceramic Department of their school, or Ferro Enamel Corporation, for complete rules.

## RECORD SALES FOR ADMIRAL

Admiral Corporation, manufacturers of major kitchen appliances, radio and television sets, had all-time record sales and earnings both in the quarter ending September 30, and for the first nine months of 1950, it has been revealed.

For the quarter ending September 30, Admiral reported net earnings of \$5,253,685, compared with \$1,475,884 in the like 1949 period. Third quarter sales rose to \$63,629,146 from \$23,967,745 a year earlier.

For the first nine months of 1950 the firm had net earnings of \$13,176,417, or \$6.59 a share on sales of \$166,924,994. This compares with a net of \$4,631,574, or \$2.32 a share, and sales of \$77,078,151 in the first nine months of 1949.

## AMERICAN STOVE SALES

### RISE 51% OVER 1949 SALES

In a statement before the quarterly meeting of the board of directors of American Stove Company, on October 25, Arthur Stockstrom, president, declared that sales for the first nine months of 1950 showed a 51% increase over the like 1949 period.

## LAYTON HEADS HARVESTER

### FOREIGN OPERATIONS

Joseph E. Layton, former general manager of International Harvester's refrigeration division and assistant director of foreign operations since last April, has been appointed director of foreign operation, it was announced by J. L. McCaffrey, IH president.

## QUEEN STOVE PURCHASES

### AMERICAN GAS MACHINE

F. A. Trow, president of Queen Stove Works, Inc., of Albert Lea, Minnesota, has announced the purchase of American Gas Machine Co., of the same city.

With the acquisition, new officers of American Gas Machine were elected as follows: F. A. Trow, president, succeeding John W. Baillie who is now chairman of the board; R. C. Trow, vice president; C. E. Holm-

to Page 50 →

# finish SUGGESTION BOX

## Speedy testing of metal finishes



**I**N many cases, the finish used on a manufactured product will be subjected to many deteriorating chemicals during its normal service life. Determining the resistance of a specific finish to these chemicals, one at a time, is a time-consuming and tedious process.

Using the apparatus shown in the accompanying photograph, the American Pipe and Construction Company, Los Angeles, can test the same finish in numerous chemicals at one time, or, conversely, can test numerous finishes in the same chemical.

The apparatus consists of a wide-mouth glass bottle, one for each test coupon, fitted with a two-hole rubber stopper. Two glass tubes lead through the stopper, one acting as an air outlet, and the other extending below

the surface of the solution and used for admitting compressed air to agitate the solution. An infra-red lamp behind each bottle is operated in "on and off" cycles, heating the solution, then allowing it to cool. If desired, the compressed air can be dehydrated prior to admitting it to the bottle by passing it through a tube filled with silica gel or a similar dehydrating compound.

This is a brutal test and should not be employed for quantitative results. But when complete resistance of a finish to certain chemicals is necessary, this method will soon ascertain whether or not it can be used.

**Source for further information on this testing method may be obtained by writing finish.**

## A new technique for inspecting metals

*(Continued from Page 21)*

arc welds in magnesium, aluminum, stainless steel, and the carbon steels are easily inspected.

The process is now used at Turbodyne for checking rough X-40 and

titanium turbine blades prior to final machining. When a defect is found, its depth can be closely estimated to determine whether it will be removed by subsequent machine operations.

If it is too deep for removal, much costly machine work is avoided. In the same company, welders engaged in critical installation of turbine blades check each weld as soon as the part becomes just warm to the touch. Thus defective welds can be detected and reworked immediately.

Inspectors for the Civil Aeronautics Administration are now using the process for periodic inspection of critical aircraft components in the field. Welded landing gear lugs, propeller blades and hubs, and engine parts can be inspected without removing them from the airplane. The process is equally applicable wherever frequent field inspection is necessary.

Though quite simple to use, like all inspection techniques, this new process has its critical aspects. Thorough pre-cleaning of the part or area to be inspected must be accomplished for dependable results. The developer coating must be applied with equal consistency as to thickness in order to estimate with some degree of accuracy the true extent of the fault. The chemicals employed—cleaner, dye, and developer—are all highly volatile and must be kept in closed containers when not in use. Contamination of the chemicals must be avoided. When brush application is used, three brushes, one for each chemical, should be employed.

None of the chemicals are corrosive to metal. The developer coating may be left on for an extended period without harm. When it is time to remove the developer, it may be dusted away with a brush, wiped away with a rag, or blown away with compressed air.

## YOUNGSTOWN ANNIVERSARY

The Youngstown Sheet and Tube Company welcomed nearly 12,000 visitors to its Youngstown district plants during its Golden Anniversary Open House on October 18.

Trips were arranged to give visitors a good view of all steel making operations from melting steel in the open hearths to semi-finished sheets for refrigerators, automobiles and similar products, and to finished pipe for oil country use.





*Merry Christmas  
Happy New Year*

The entire McDanel organization  
joins in wishing its many friends  
and readers of Finish a Merry  
Christmas and a Happy New Year!

**CHICAGO VITREOUS  
ENAMEL PRODUCT CO.**  
CICERO 50, ILL.

*Exclusive representative  
for the Enamel Industry*

**MCDANEL  
REFRACTORY PORCELAIN CO.**

BEAVER FALLS, PA.

Makers of **QUALITY** Porcelain Products

→ from Page 47

quist, secretary-treasurer; R. A. Trow, R. D. Putnam and B. O. Knusdon, director.

It was indicated that American Gas Machine would continue to produce ranges and heaters, and would be operated as a separate company.

### BELLAIRE GEN. MGR. DIES

J. G. Johnston, general manager of The Bellaire Stove Company, Bellaire, Ohio, died October 10. He entered the stove business in 1898 following graduation from high school. Working with his father, who was then manager of the company, he held about every type of job in the factory and office during his 52 years with the firm.

### LEONARD & BAKER HEAD DIES; WELCH INDUSTRIES BUY FIRM

Eugene L. Baker, president of Leonard & Baker Stove Co., died at his home in Taunton, Massachusetts, October 4. Leonard & Baker was founded in 1907 by Mr. Baker.

Welch Industries, Inc., headed by Francis E. Welch of Pawtucket, R. I., has purchased Leonard & Baker. J. Donald Fox, management engineer, will serve as general manager of the firm which will be operated as a division of Welch Industries. Fox has announced plans for expanding the distribution of the firm's line of dual-oven combination ranges on a national basis.

### 1951 PEI SHOP PRACTICES FORUM, OCTOBER 10-12

The 13th Annual Shop Practices Forum of the Porcelain Enamel Institute will be held at Ohio State University, Columbus, Ohio, October 10, 11, and 12, 1951, according to an announcement by Edward Mackasek, PEI managing director.

### CENTRAL ENAMELERS TO MEET DECEMBER 8

The next meeting of the Central District Enamelers Club will be held Friday evening, December 8, at Hotel Allerton, Cleveland, Ohio.

The principal topic to be discussed will be "Curtain Wall Construction." Joseph Lacey, of Saarinen & Saarinen Associates, architects for the new General Motors Research Building in

Detroit, will discuss porcelain enamel curtain wall construction. Robert Weaver, Jr., of Bettinger Enamel Co., Waltham, Mass., will explain manufacturing operations of the panel.

### NEW BINKS PLANT IN SOUTHERN CALIFORNIA



Binks Manufacturing Company has purchased a new plant, located at 4915 Pacific Boulevard, Los Angeles, in order "to better serve the rapidly expanding industrial west." Burke B. Roche, Binks president, stated that rapid growth of the company's business in the Los Angeles area over the past 10 years made their old quarters inadequate.

The new plant will be operated under the direction of J. E. Roche, manager of Binks' West Coast Division. It will serve as a focal point for all branch activity involving the

warehousing and selling of standard spray finishing and water cooling equipment and the assembly of air compressors. Spray finishing booths and water cooling towers will be assembled in the new plant from parts made in the company's main plant in Chicago. There will also be some sheet metal fabrication.

The new building, formerly occupied by Allegheny Ludlum Steel Corp., is of concrete construction with a rigid steel-frame saw-tooth roof. It is 80 x 140 feet on a 100 x 250-foot lot.

### CERAMIC ENGINEERING SCHOLARSHIPS AWARDED AT U. OF I.



Five scholarships in ceramic engineering were awarded recently to students at the University of Illinois, according to Prof. A. I. Andrews, head of the school's Department of Ceramic Engineering. Prof. Andrews said that funds for these scholarships were made available through grants

from industrial firms and associated organizations.

Shown in photo, left to right, are: J. P. Hammond, Benton; R. E. Cowan, Milford; R. A. Jacobs, Chicago; and J. Schultz, Jr., Chicago. E. J. Schuckert, Stockton, also awarded a scholarship, is not in the picture.



## IF YOU'RE FISHING . . .

. . . It will be smart to have us on your line

And you can be certain that there are no suckers where we do business!

Right now we are enabling many stamping producers to increase their output by supplementing their plant facilities with our own. Perhaps we're in a perfect position to make real money for you. In the event that your own enameling plant is too busy to handle your present output, or if you have no finishing plant, write us immediately on your company letterhead, or simply use the handy coupon below to see how we can work for you. For the fascinating story of Porcelain Enamel, request your free copy of a beautifully illustrated 16 page booklet. No obligation, of course.

*Remember, too, that through the use of Porcelain Enamel, it's a lot easier to land the big sales—for only Porcelain Enamel gives years of time-erasing, matchless beauty. Why not cast us a line today?*



VITREOUS STEEL PRODUCTS COMPANY  
Box 1791, Cleveland 5, Ohio

- ☐ Enclosed is a rough sketch of what we are planning to have Porcelain Enameled. Please rush us your suggestions.
- ☐ Send us the FREE 16 page Porcelain Enamel booklet.

Name ..... Title .....

Company ..... Product Mtd. ....

City ..... Zone ..... State .....

# VITREOUS STEEL PRODUCTS CO.

BOX 1791, CLEVELAND 5, OHIO (Factory at Nappanee, Ind.)

## KOENIG NAMED TO GE POST

The appointment of C. F. Koenig as assistant to the supervisor of production, refrigerator division, at the Erie (Pa.) Works of General Electric Company has been announced by W. B. Hill, manager of manufacturing, household refrigeration division.

## LINK-BELT'S HOLL DIES

Julius S. Holl, advertising manager of Link-Belt Company for almost 40

years, died October 24 after a prolonged illness.

## AIR RESEARCH CONTRACT TO ALFRED UNIVERSITY

A contract for the study of the migration of metals in titanium carbide has been received by the research department of the Ceramic Experiment Station at Alfred University, according to Dean John F. McMahon, of the N. Y. State College of Ceramics, Alfred, N. Y. The contract was award-

ed by the Office of Air Research of Wright-Patterson Air Force Base, Dayton, Ohio.

## BURNHAM KING TO BATTELLE

Dr. Burnham W. King, formerly in charge of ceramic research at The Harshaw Chemical Co., has joined the staff of Battelle Institute, Columbus, Ohio, where he is engaged in research on ceramic problems. Dr. King is well known for his many professional contributions, both applied and theoretical, in the ceramic field.

## DE VILBISS APPOINTMENTS

Roy A. Guyer, vice president in charge of sales for The DeVilbiss Company, has announced the appoint-

**STOP** **THE MAGNET**  
**IS YOUR DRAGNET**

**FRANTZ FERROFILTER**  
magnetically removes from ceramic liquids  
iron particles as fine as one micron.

**STOP**

**STOP IRON CONTAMINATION.** Take it out of your enamel easily, efficiently and economically, with the FRANTZ FERROFILTER. How does it work? Simple. The FERROFILTER consists of a stack of strongly magnetized grids through which the liquids flow. The hundreds or even thousands of feet of magnetized edges offer slight resistance to the flow, but comb and re-comb the liquids, giving an extremely high efficiency of removal of the magnetic particles which are retained until the end of the run. Viscous and heavy liquids are handled readily... all viscosities up to the heaviest materials. Grids of the proper opening sizes are furnished in accordance with the consistency of the liquids to be handled. All FERROFILTERS are easily cleaned, the grids being readily removable.

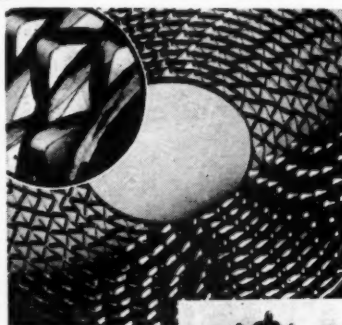
FRANTZ FERROFILTERS are now in successful operation in small, large and great plants throughout the world. There's a place for the FERROFILTER in your millrooms, too.

**Note:** For dry process enamellers. Our Dry FERROFILTER model 68V is successfully removing iron from dry enamel in important plants.

Why not write today for full information?

**S. G. FRANTZ CO., INC.**  
P.O. BOX 1138 • TRENTON 6, N.J.

Authorized Representatives for the Enameling Industry  
FERRO ENAMEL CORPORATION CHICAGO VITREOUS ENAMEL PRODUCT CO.  
4150 East 54th Street Cleveland 5, Ohio 1425 So. 53th Court Cicero 50, Ill.



Above—The heart of this Electro-magnetic FERROFILTER is the patented grid illustrated, of which 16 to 30 units represent hundreds of feet of sharp, magnetized collecting edges.

Right—Gravity type FERROFILTER. Excellent for glaze, enamel, and general use. Light and portable. Made in four sizes.



**WET FERROFILTERS**  
Gravity—Pipeline—  
Underfeed

**DRY FERROFILTERS**  
For dry process enamels  
and other ceramic materials



E. F. FREY  
H. M. KIDD



ments of Emil F. Frey as director of sales promotion and advertising, and Henry M. Kidd, as sales manager of spray finishing equipment sales. Guyer also announced that John M. Ehni has assumed the joint duties of export manager and branch plant coordinator.





# APEC

Merry Christmas  
and a  
Happy New Year

Manufacturers of washing machines, stoves, refrigerators, heaters, kitchenware, signs, table tops, and other porcelain enameled products — you can improve your product finishes and at the same time cut production costs by using APEC porcelain enamel frits. That goes also for all types of metal products where porcelain enamel can be used to advantage.

Open the door for a demonstration of APEC frits and you open the door to new possibilities for increased production in your finishing department and decreased cost per square foot of finished ware.

A modern smelting plant and experienced field and plant personnel are back of every bag of APEC frit. We sell you the frit and we see that it works in your plant. APEC customers stay APEC customers.

Phone or drop us a note now. You will get prompt and friendly attention without obligation.

*Quality*

•FRITS•

*American Porcelain Enamel Co.*



1285 E. KEATING AVE. • PHONE 2-8808  
MUSKEGON, MICHIGAN

### PHILCO ENGINEERING APPT.

Leonard C. Bastian, for the past 12 years technical director of the Air Conditioning and Refrigerating Machinery Association, is reported to have joined the engineering staff of Philco Corporation.

### FRIGIDAIRE MAN HEADS

#### CANADIAN ELECTRICAL GROUP

W. Carl Cannon, president and general manager of Frigidaire Products of Canada Limited, Leaside, Ontario, was elected president of the Canadian Electrical Manufacturers Association at their 6th annual meet-

ing held recently in Niagara Falls, Ontario.

### WINTER HOMEFURNISHINGS

#### MARKET OPENS JANUARY 8

The International Winter Homefurnishings Market will be held in Chicago, January 8 through 19, at The Merchandise Mart and the American Furniture Mart.

### PAINT, GLASS FIRM'S THIRD

#### QUARTER SALES UP 14%

Pittsburgh Plate Glass Company, manufacturers of appliance finishes,

paints, glass, and chemicals, had the largest sales volume in its history in the third quarter of 1950, according to Harry B. Higgins, president.

Sales totaled \$93,493,210, an increase of 28% over volume in the third quarter of 1949, and a gain of 14% over the previous peak of \$82,170,767 established in the second quarter of this year.

### NEAL GALLAGHER DIES

W. Neal Gallagher, 55, president of Automatic Washer Company and



a veteran figure in the home laundry equipment industry, died November  
to Page 77 →

## NO SHUT DOWN

to carbon treat solution with . . .  
*horizontal*



### SPARKLER *plate* FILTERS

Only a few minutes are required to lift out the horizontal plate assembly in a Sparkler Filter and drop in a clean set of filter plates and production is under way without appreciable interruption.

Tanks are given a carbon treatment without shutting down production in the battery installation shown here. One or two filters are cut out of the line, drained, cleaned and dressed with clean filter papers. The proper amount of carbon is mixed with water in a stand-by tank and recirculated through the filters thus depositing the carbon on the plates in a cake of uniform thickness and density. The solution requiring a carbon treatment is then circulated through the carbon beds giving the plating solution the carbon treatment without contaminating the tank or stopping plating operations.

Sparkler Horizontal Plate filters give absolutely sharp filtration at all stages of the cycle.



A battery of 18 Sparkler Filters in one of the largest bright nickel plating plants in the world.



**SPARKLER  
MANUFACTURING CO.  
MUNDELEIN, ILLINOIS**

### PEI annual meeting

→ from Page 39

Convention. It is planned to make this cooperative effort an outstanding feature of the NESA show.

F. W. Woelagle, chairman of the Commercial Research Committee, announced that a survey would be conducted among major sign buying industries to determine preferences for sign finishes, and other details of importance to the Sign Division.

R. H. Coin acted as division chairman for the Table Top group at its section meeting. The general feeling seems to be that the porcelain enameled table top is "a dying cause", because of lack of product development and proper promotion.

This division plans to back the general building promotion program of the PEI, and it will be interesting to see whether one or more companies

in this formerly strong section of the Institute will develop products and promote them in such a way that a worthwhile market will be regained. At present, the principal companies seem to be diverting their manufacturing efforts to other products.

#### Plumbing Fixtures Division

##### needs steel

The shortage of enameling stock will probably hit this division of the PEI with greater impact than any of the other divisions, because of the fact that there is greater need for enameling grade stock for this division's products than for some of the other items which are commonly enameled.

C. J. Rodman served as chairman of the division meeting, in which it was pointed out that a great deal of educational work is needed with government and with trade groups and the public to increase the acceptance of steel for plumbing fixtures.

It was pointed out that enameled steel plumbing ware price increases

have been lagging behind price increases on other commodities.

#### Market development

##### program approved

The Market Development Committee, under the chairmanship of D. H. Malcom, Armco Steel Corporation, presented a program for market development which included a continuation of the established publicity program which has been carried on by the Institute during recent years, plus the establishment of a quarterly publication pointed to the building industry. This quarterly booklet will be planned to further the cause of architectural porcelain enamel as well as all the other enameled products which are logically used in and around the home.

Plans of the other active committees of the PEI will be reported in *finish* as their development progresses.

#### Defense problems highlighted

In an "off the cuff" talk before the

Institute meeting, L. S. Hamaker of Republic Steel Corporation pointed to some of the reasons that "there is not enough steel capacity for today's demand". Reference was made to 10,000,000 tons of new capacity coming into steel production this year; also, that steel expansion is greater than at the peak of wartime demand.

One point that should be remembered by all steel users is that regardless of the steel making capacity in the country, the plants cannot be operated without raw materials. The iron ore situation is reported as "probably tight by spring", even for present requirements.

Other speakers before the group were Milton A. Smith, U. S. Chamber of Commerce, on the subject of controls, and Donald F. Hagner, Federal Reserve Bank of Richmond, Baltimore Branch, on "Loan Guarantees for Defense Production."

#### Critical materials discussed

A discussion on critical materials was headed by R. H. Turk, Pemco

## HAND PAINTED TIES PROMOTE RANGE SALES



As part of its promotion plans for its line of ranges which are being marketed in a variety of colors, Chambers Corporation is outfitting its representatives with hand painted ties. Art Scheffer, Chambers sales manager, proudly displays neckware which is available in various colors, matching shades of Chambers ranges.

## It's MISCO for HEAT RESISTING ALLOYS IN ROLLED MILL FORMS

Sheets — Plates — Rounds — Squares — Hexagons — Flats — Angles — Channels — Sections — Pipe — Nuts — Welding Rod

**If You Use Heat Resisting Alloys for Enameling Fixtures**



**Send for this STOCK LIST**

WE SPECIALIZE IN A.I.S.I. TYPES 330, 310, 309, 430

**ROLLED PRODUCTS DIVISION**  
**Michigan Steel Casting Company**

**MISCO**  
Heat and Corrosion Resistant Alloys

1999 GUOIN ST. • DETROIT 7, MICH.  
One of the World's Pioneer Producers and Distributors  
of Heat and Corrosion Resistant Alloys

Are you getting your share of this  
 now you can reach this  
 multi-billion dollar home  
 appliance manufacturing  
 industry with



• finish is the only industrial trade publication edited specifically for the producers of home appliances and allied metal products.

• finish is the only publication with blanket coverage of all producing plants and with individual copies reaching management, purchasing, design engineering, and key plant personnel.

#### Editorially . . .

finish covers technical and practical plant production problems from the time the metal enters the plant until the finished product is shipped. Special emphasis is placed on fabrication, metal preparation and metal finishing. finish is the spearhead of the National Safe Transit Program for reduction of packaging and shipping losses.

The monthly news section of finish is "must reading" for all management and key personnel throughout this broad metal products market.

Send today for our best salesman  
 . . . a copy of finish magazine

*Dana Chase*

**PUBLICATIONS**

360 North Michigan Avenue  
 CHICAGO 1, ILLINOIS

**.BIG MARKET?**

The advertisement at the left is reproduced from a recent finish advertisement in Standard Rate & Data, a service for advertising agencies.

The printed statistical information shows something of the size and importance (based on 1949 production and sales) of one important segment of finish readership.

Now look at the % increase figures for some of these major products during 1950.

It's a growing market, and your business can grow with it if you advertise in the one publication designed to meet its editorial needs—finish.

#### Market

Readers of finish sold in 1949 —

4,450,000 Electric refrigerators  
 1,056,000 Electric ranges  
 485,000 Home freezers  
 695,000 Water heaters (electric)  
 3,200,000 Washing machines  
 300,000 Ironing machines  
 85,000 Dryers (gas and electric)

plus 21,797,000 other major and small electrical appliances.

**Total Value \$3,017,844,000**

In addition they produced —

2,436,625 Cooking ranges (gas and other non-electric)  
 3,658,936 Heating appliances (gas and other non-electric)  
 1,656,000 Gas water heaters  
 637,000 Central heating units

plus millions of additional units in sanitary ware, metal cabinets, and a comprehensive group of metal products not listed here.

#### Logical Advertisers

Any company producing raw materials, equipment or components used in the production of appliances or allied metal products can reach this vast market direct by advertising in finish.

*% increase during 1950*

*39%*  
*25%*  
*62%*  
*28%*  
*724%*

*56.6%*  
*63%*

*All others up in varying percentages*



Corporation. Many of the important materials for the production of porcelain enamel were covered, but Mr. Turk summed up his presentation by saying "I feel you will be able to get all of the enamel required for the steel you can get".

Cobalt is in the limelight because it is in great demand for specialized war production, and also is a "must" in the production of ground coat enamels.

Nickel is another material which may cause some difficulty in enameling plants.

At present, titanium in the grade used for porcelain enamels is in adequate supply.

It is understood that the demand for antimony for fireproofing, which was so great during World War II, is no longer strong.

Nitrates and phosphates are of course in great demand during any war period.

Colors for enamels will be affected, because of demands for cobalt, chrome, vanadium, cadmium, etc. This will unquestionably affect some specialized products, but should not have too great an effect on the overall picture for porcelain enameled ware.

#### PEI gets distinguished

##### service award

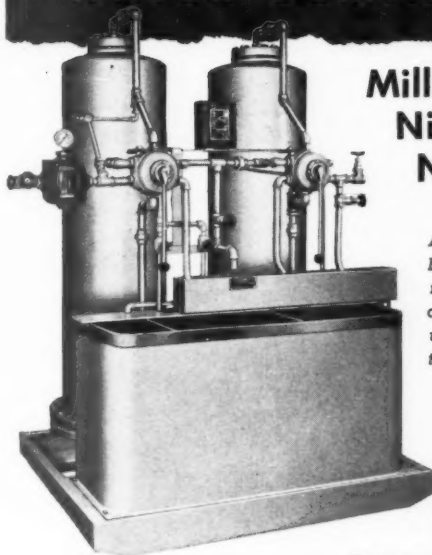
An award for distinguished service "to its industry and the public" was made to the Porcelain Enamel Institute by American Trade Association Executives. The award plaque was presented during the banquet to the Institute president, and to a representative of the National Safe Transit Committee. The award to PEI was based on its work in connection with the National Safe Transit Program for reducing packaging and shipping losses (see Page 70).

The 19th annual meeting was claimed by many Institute members as one of the finest that has been held in recent years. The choice of locale was probably influenced by the fact that a high percentage of those in attendance were accompanied by their wives. This may very logically continue to influence the selection of "top" meeting places.

finish DECEMBER • 1950

## For PURE Water

### INDUSTRIAL WATER DEMINERALIZERS



#### Mill Room Water Nickel Dip Solutions Neutralizer Solutions

A Two-Bed INDUSTRIAL Water Demineralizer. Standard two- and four-bed units available with capacities of 200 to 1000 gph. Special units of any capacity engineered to requirements.

**you SAVE  
many ways...**

Cost analyses are proving that the use of raw water in metal coating processes is not so cheap after all. This is especially true when mineral-free water can be obtained for a matter of cents per 1000 gallons in any quantity with an INDUSTRIAL water demineralizer.

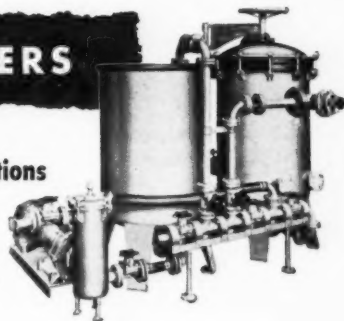
The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed — keeping space requirements at a minimum.

It's simple to get the complete facts for your case. Send us a water analysis and let us know how much water you have to treat and the gallons per hour needed. We can then give you the whole demineralizer story including estimated costs, equipment required, performance data, etc., for your requirements.

### INDUSTRIAL FILTERS

#### for Clarification of Nickel Dip Solutions — Neutralizer Solutions ANY QUANTITY

A Typical INDUSTRIAL Filter. Standard portable and stationary models available with capacities of 100 to 15,000 gph. Special filtration systems engineered to meet unusual requirements.



Write for full information and recommendations.

### INDUSTRIAL FILTER & PUMP MFG. CO.

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FILTERS	PUMPS	CORROSION TESTING APPARATUS
Pressure Type	Centrifugal	Salt Fog • Humidity
RUBBER DIVISION		WATER
Vulcanized Linings • Molded Products		DEMINERALIZERS

## Review of 1950 New Supplies and Equipment

### L-1. New hydraulic control for commercial cooking equipment

A new hydraulic throttling type control for commercial cooking equipment has been announced. It embodies a standard type diastat, has fast opening feature when set at top of temperature ranges, has large



capacity for its size, is compensated for ambient temperature up to 350°, and is available only with high temperature equipment diastat. The diastat can be removed and replaced without disconnecting body.

### L-2. Micro-bellows pump

A pulsation type pump which delivers a constant rate over long periods has been developed. The pump has no packing gland or stuffing box, eliminating the danger of contamination of product by lubricants.

### More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form on this page.

Designed primarily for laboratory scale pumping of materials which are liquid at room temperature but can be adapted to pump low boiling liquids and viscous materials.

### L-3. New adhesive for fastening labels to appliance surfaces

In addition to its original use for fastening instruction labels on circuit diagrams to electrolytic tin plate,terne plate and other metal surfaces, a new paper-to-metal adhesive now is claimed to hold effectively to enameled or painted surfaces on home appliances.

Another new use for the adhesive has been found in applying paper labels over the gloss printed areas of folding cartons or paper packages.

This semi-fluid, white, latex-resin emulsion adhesive weighs 8.4 lbs. per gallon, is dilutable with water, and can be applied by hand brushing, gumming machines, or spray guns to adhere porous materials to many non-porous surfaces. The adhesive is said to be fast setting, holding porous materials and labels immediately on

contact with a permanent bond that will not shrink, crystallize or allow assemblies to delaminate. In table model gumming machines, it is said to operate without foaming or build-up on the rollers.

A laboratory report, listing complete technical data and test reports, together with suggested uses, is available.

### L-4. New pre-assembled fasteners



A new fastener, with the nut and lock washer pre-assembled as one unit, is said to have the following advantages: only one unit to handle; washer can't drop off but is free to rotate; free spinning facilitates assembly.

Applications suggested by the manufacturers include: securing an upright brace to the top of a range; holding drain boards to wringers of washing machines; and for use in motor mounting for electric fans.

### L-5. Small snap-action switches

An expanded line of small size, precision, snap-action electrical switches for industrial use is offered. These are said to be a development of high-accuracy aircraft switches.

Snap-action of contacts is extremely rapid, arcing is greatly reduced and there is no dead center position.

#### FINISH

360 N. Michigan Ave.  
Chicago 1, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_

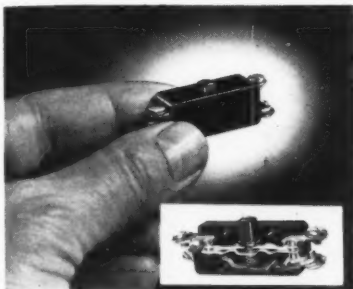
Company \_\_\_\_\_

Company Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Switching action, it is said, is independent of the speed of the actuator. Features emphasized are the small size, compact design and light weight.

In use unit is often enclosed in a protective metal housing. Special



housings available for general-purpose, enclosed and splash-proof switches.

Switch for general purpose applications (inset on photo) may be wired for normally-open or normally-closed operation by using only two terminals.

#### L-6. Dispenser for filament tapes



A new hand dispenser for dispensing lengths of tough tear-resistant filament tapes is announced. The new all-metal unit is designed for use with filament and other hard-to-cut tapes. It can be used with tape rolls up to 72 yards in length, and accommodates tape widths from  $\frac{1}{2}$  to 1 inch.

Main feature of the new dispenser is a razor-sharp cutting edge. A thumb-operated trigger presses the cutting blade against the tape to make the cut. When the trigger is released

the blade retracts so that it cannot cut accidentally.

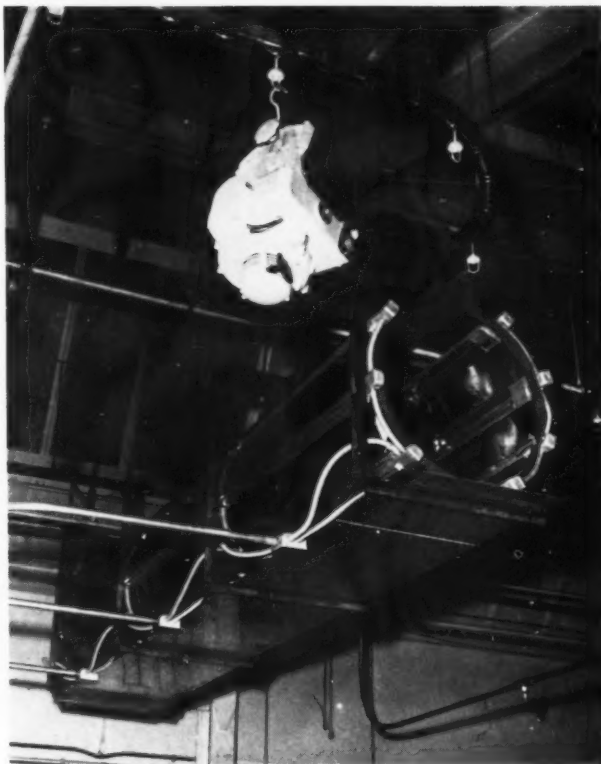
#### L-7. Separator removes iron from liquids flowing in large pipes

A new pressure-tight non-electric magnetic iron from liquids, slurries and slips, flowing in pipelines that vary in diameter from 6" to 20", is now available. It is said to prevent tramp iron damage to such processing equipment as pumps, grinders, refiners, etc.

This "pressure hump" is a flow-

interrupting unit. This means that strategically placed baffles direct material flow 30° from the normal straight line so that two stainless steel plate-type magnets installed on opposite faces of the hump can set up a magnetic barrier in tandem; what one misses the other catches. This "pressure hump" is said to perform satisfactorily with materials flowing at volumes from 50 cfm to 250 cfm, depending upon consistency. Pressures up to 45 psi may be safely employed, it is stated.

#### L-8. Space-saving aerial electric radiant oven



Two minutes of intense, zoned infra-red heat in a space-saving aerial electrical radiant oven provides rapid curing action and a hard true color to synthetic enamel sprayed on gasoline engines manufactured by a California firm.

No floor space at all is taken up by the baking operation. The all-metal infra-red oven, which is conveyorized, is said to deliver consistent results on a production basis with low maintenance cost and trouble-free operation.

Clearance inside the oven is 26

inches. Conveyor speed is constant at approximately  $5\frac{1}{2}$  feet per minute.

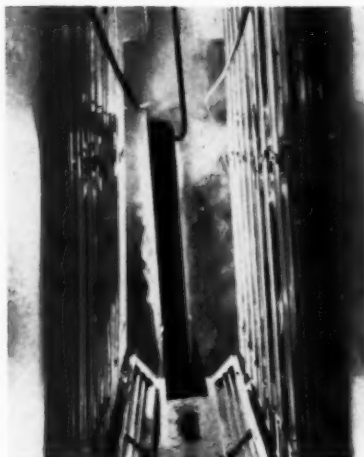
For maximum drying speed at the proper temperatures, three zones of heat are provided in the oven, which is actually three ovens in one, made up of three sections of 4-foot electric radiant heaters.

The first section through which the work passes is operated at full intensity for high initial heat and to bring the material very rapidly to the best drying temperature. Heat tapers off in the last two sections through the use of contactors and input control-

lers to maintain exact baking temperatures. Generally, the heaters in these two sections operate at 50% and 25%, respectively, of full capacity.

The compact ceiling oven—12 feet above the floor—isn't out of sight, but it is out of mind because maintenance is said to be a very minor factor; no breakage problem exists because of the all-metal heater construction.

**L-9. Degreasing with infra-red**



Space saving infra-red ovens that remove all trace of oil on sheet metal parts in less than one minute are now available. Grease is said to vaporize before the intense heat generated by the infra-red heaters. The ovens are available with continuous conveyors to eliminate excessive handling.

**L-10. New tramrail trolley design**



An improved tramrail trolley for use on hand or electric powered tram-rail systems; transfer bridges, and tramrail cranes is announced. Operator fatigue is said to be reduced and payloads increased through elimination of dead parasite weight and reduction of rolling friction.

Drawbar pull on the heavier capa-

city trolleys after normal break-in period is said to be reduced to 15 pounds per ton to start the load rolling and 10 pounds per ton to maintain momentum. Factors of safety built into the new trolleys are reported to enable them to take shock loads considerably higher than their rated capacity. The trolley yoke swivels freely on a rolled steel king-pin to eliminate binding of wheel flanges on curves and switches of short radii.

**L-11. Read relative humidity and temperature at a glance**



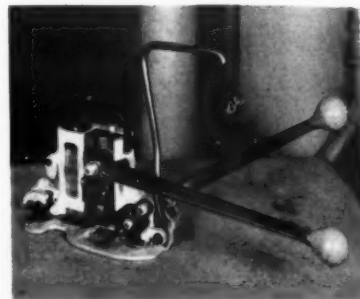
A new direct reading humidity and temperature indicator is now coming off the production lines. It shows at a glance the relative humidity and temperature of the air to which it is exposed.

The humidity scale is graduated into 10 equal divisions from 0 to

100% over an area of 2½ inches. The thermometer is a red liquid filled, lens front type and is accurate to within 1 degree at 70 degrees F.

Overall dimensions are 5⅜ inches long by 3⅝ inches high by 1-11/16 inches deep.

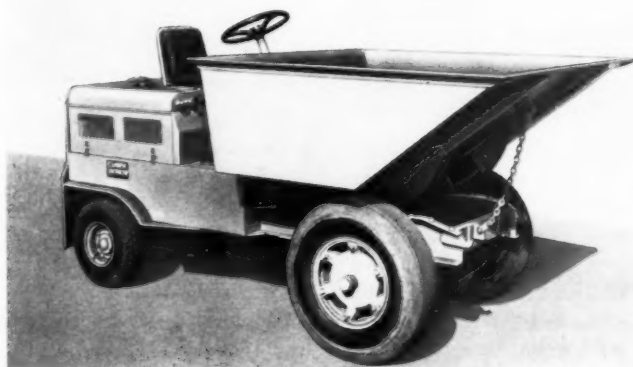
**L-12. Automatic seal feed tool**



A new automatic seal feed tool for ¾" strapping has recently been announced. This new tool, which is said to be the lightest ever built for ¾" strapping, weighs only 15 lbs. It was field-tested for 18 months.

The new tool tensions and cuts the strapping; automatically feeds the seal and crimps it to complete the operation. The seal magazine is designed for quick loading and holds a clip of 75 seals. The tool can be released at any point in its operating cycle if it is necessary to relocate the strap.

**L-13. New haulage vehicles for bulk materials**



Increased speed, reduced size and greater stability are three of many new features of a redesigned line of haulage vehicles for bulk materials.

A new two-speed transmission per-

mits 14 m.p.h. travel in high gear and 8 m.p.h. in low gear, in both forward and reverse. Can be operated with ease, indoors and out, and even through narrow factory aisles.



#### L-14. Portable greasing outfit

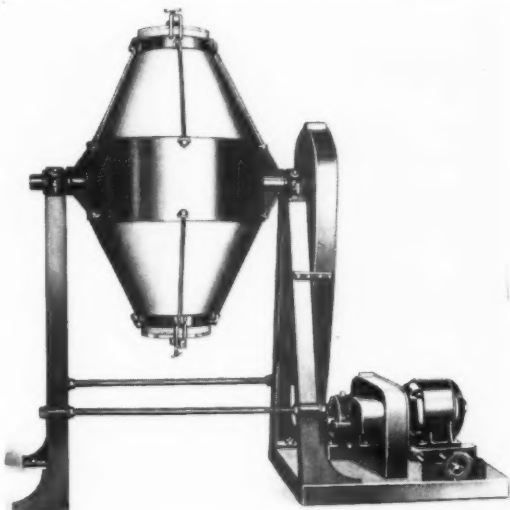
Two models of a portable "one man-one hand operating greasing outfit" for industrial use have been announced.

Two elements comprise this new greasing outfit — a loading and a grease gun. The loading pump is mounted in a rigid steel cover which fits the top of any standard 25 or 35 pound size original lubricant bucket

or pail, replacing the original container cover.

Pressure of grease delivery at the fitting is controlled by the operator to fit the requirements of the bearing being serviced. It is claimed to be possible with either gun, by exerting extreme "push action," to effect up to 10,000 pounds per square inch delivery pressure on "frozen" bearings.

#### L-15. New cone blender for material processing



A new cone blender is now available for processing materials which must not be brought in contact with metals. The manufacturer states that this blender is the first of its type.

The cone blender shown in the photo has a complete porcelain cone which holds 56 gallons. The inside diameter at the widest point is  $24\frac{1}{4}$ ". The inside length is  $46\frac{3}{4}$ ".

#### L-16. New invisible cabinet latch



A new hidden latch for cabinet doors, appliance doors, etc., is called "Tutch Latch" and employs only two moving parts. Designers interested in

smooth, unbroken exterior lines on cabinets or appliances will be interested in the fact that Tutch Latch has no visible part on the exterior of the door. A light pressure of the finger, wrist or elbow on the door panel releases the latch and opens the door . . . no handles, knobs or pulls. It is installed with the strike on the door and the latch fastened inside the cabinet.

#### L-17. Fast-drying synthetic enamel

A new fast-drying enamel can reduce a manufacturer's finishing time by 40 per cent and cut his storage and

handling requirements by 50 per cent, according to the producer.

The new synthetic protective coating is claimed to provide the hardness of a baked-on synthetic, but air-dries as fast as lacquer, in just a few minutes. It was designed particularly for plants which do not have baking facilities.

#### L-18. Wipe-on method for stamped, engraved and etched parts

A semi-solidified paint in handy stick form, developed and compounded especially for wipe-ons or fill-ins of stamped, engraved or etched markings and designs on all types of smooth surface materials — metals, glass, ceramics, plastics, etc. Its value to manufacturers is its extreme quickness and ease of application. It is only necessary to rub the stick over the impression and wipe off the surface residue. The filled-in markings stand out clearly and distinctly at once and the part can be handled immediately without smearing.

#### L-19. New "glass" shipping tape



In a paper presented before the Michigan Chapter of the Society of Industrial Packaging and Materials Handling Engineers, Irvin Danielson, a packaging research engineer, described a new tape with glass filaments permanently imbedded in a resilient rubber adhesive — thus reinforcing the tape "like steel rods reinforce concrete." →

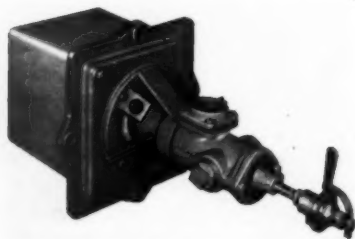
The new tape has an acetate film backing and has glass filaments instead of rayon—thousands of parallel filaments that run lengthwise with the tape. The tape is recommended for strapping widely varying products from fibre-board cartons to banding steel coils and pipes.

#### L-20. Rotary tank Magnetools



A new series of Magnetools for use in plating work is now being marketed. 360° loading and complete, instantaneous unloading are the features. Advantages stressed by the manufacturer are that the tool cannot attach itself to the tank, will not injure the tank lining, unloads instantly, is of stainless steel and Neoprene construction thruout.

#### L-21. Dual fuel burners



A new line of dual fuel burners for combination gas-oil applications has been especially designed for such rugged use as forging, heat treating, smelting, kiln and drier firing with light or heavy oils and low pressure

air as well as gas of any Btu content.

Of major importance in improvements is a new refractory tile which has been redesigned to give greater stability to the flame without the danger of carbon formations. The tile is shipped from the factory cemented and bolted to the tile mounting. This is said to simplify installation of the tile to the furnace and also to prevent the tile from separating from its mounting during operation.

#### L-22. New panel instruments



A line of modernistic panel instruments in three different models is now available to give manufacturers a complete line of both conventional and modernistic design.

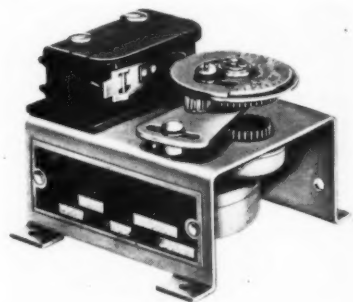
The models all have easy to read scales which add to greater readability under varied lighting conditions. The etched faces extend across the entire front of the meter and are covered with unbreakable plastic.

#### L-23. Recycling timers for appliance and industrial applications

A new cam recycling timer is designed to repeat a given electrical "on" and "off" time cycle continuously. It consists of a heavy duty synchronous motor, an adjustable cam, and a single pole, double throw snap action switch—all assembled on a steel chassis to give a compact unit, 3-1/16 x 2-13/16 x 2-1/4 inches, which can be mounted against a back panel by means of four 6-32 screws.

In actual practice, the cam is adjustable for "on" and "off" cycles ranging from 2% to 98% of the total over-all time cycle. Over-all time cycles may be changed on these

cam recycling timers by substituting different ratio gear and rack assemblies. Fifty such assemblies are avail-



able as standard equipment. Over 650 different time cycles—from one revolution in fifteen seconds to one revolution in 72 hours—can be obtained. The timer is adaptable for innumerable applications pertaining to process control, furnace heat control, defrosting, fan and blower control, pulsing, refrigeration, flashers and blinkers, testing equipment, oil burner control, soldering pot control, etc.

#### L-24. Compact bench model grinder for light work



Free-hand grinding of castings, forgings, stampings, plastics, etc., where little stock removal is required, represents an important need in industry, for which this small, inexpensive bench model grinder was designed.

This new vertical spindle grinder has an approximate weight of only 575 pounds, complete with its 13" diameter abrasive wheel. It is 31" high and 28 1/2" wide overall.

# safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the major home appliance and allied metal products field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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**WHAT DO USERS SAY ABOUT Wirebound?**

*(this)*

Report by flexible power saw company shows shipping weight reduced from 820 to 775 pounds, tare weight cut 20%, crating time slashed 30%. Company stacks units four high—placing 2325 lb. load on bottom Wirebound. Shipping damage due to container failure has been completely eliminated.

*(this)*

World's largest manufacturer of portable electric tools now ships its 290 lb. universal valve and tool grinder in a Wirebound weighing only 39 lbs. The protection against shipping jolts and shocks afforded by the steel wire—thinner wood construction of Wirebounds is so effective that machine tolerances of .005 are now maintained.



*(and this)*



Maker of 310 lb. motor tractor chose Wirebound boxes when first entering export market for the anti-pilferage feature of the twisted wire closure (other closures available) . . . found shipping operations moved easily . . . packing took just 15 man minutes including interior bracing and Wirebound mat which wraps around all 4 sides.

*choose your course of action*

**Wirebound**  
BOXES & CRATES

☐ Send me general information . . . complete descriptive book titled "What to Expect from Wirebounds."

☐ Send me specific information . . . tear sheets of case histories of packing products similar to mine.

☐ Give me direct action . . . send a sales engineer to show the advantages of Wirebound packing for my own product.

NAME	POSITION
FIRM	
STREET AND NUMBER	
CITY	ZONE STATE

OUR PRODUCT IS **WIREBOUND BOX MANUFACTURERS ASSN.** IT WEIGHS

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Chicago 4, Illinois  
Users' names on request.

*mail now to*

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American Central Div., Avco Corp.  
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American Stove Company  
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American Stove Company  
St. Louis, Missouri

Andes Range & Furnace Corporation  
Geneva, New York

Apex Electrical Manufacturing Co.  
Cleveland, Ohio

Appliance Manufacturing Company  
Alliance, Ohio

Automatic Washer Company  
Newton, Iowa

The Bellaire Enamel Company  
Bellaire, Ohio

Belmont Stamping & Enameling Co.  
New Philadelphia, Ohio

Bendix Home Appliances, Inc.  
South Bend, Indiana

Caloric Stove Corporation  
Topton, Pennsylvania

Canton Stamping & Enameling Co.  
Canton, Ohio

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Chambers Corporation  
Shelbyville, Indiana

Conlon Bros. Mfg. Co.  
Chicago, Illinois

Conlon-Moore Corporation  
Chicago, Illinois

Cribben and Sexton Company  
Chicago, Illinois

Crosley Division, Avco Mfg. Corp.  
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Crunden Martin Manufacturing Co.  
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The Dexter Company  
Fairfield, Iowa

Dixie Foundry Company, Inc.  
Cleveland, Tennessee

Federal Enameling & Stamping Co.  
Pittsburgh, Pennsylvania

The Fletcher Enamel Company  
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The Floyd-Wells Company  
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General Electric Company  
Erie, Pennsylvania

Globe American Corporation  
Kokomo, Indiana

Hardwick Stove Company  
Cleveland, Tennessee

Hotpoint, Inc.  
Chicago, Illinois

International Harvester Company  
Evansville, Indiana

Kaiser Metal Products, Inc.  
Bristol, Pennsylvania

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Meadows Division, Thor Corporation  
Bloomington, Illinois

Midwest Mfg. Div., Admiral Corp.  
Galesburg, Illinois

Moffats, Limited  
Weston, Ontario, Canada

The Moore Enameling & Mfg. Co.  
West Lafayette, Ohio

Murray Corporation of America  
Scranton, Pennsylvania

Murray Manufacturing Company  
Murray, Kentucky

Nash-Kelvinator Corporation  
Grand Rapids, Michigan

Nashville Division, Avco Mfg. Corp.  
Nashville, Tennessee

National Enameling & Stamping Co.  
Milwaukee, Wisconsin

Norge Division, Borg-Warner Corp.  
Effingham, Illinois

Norge Division, Borg-Warner Corp.  
Herrin, Illinois

Norge Division, Borg-Warner Corp.  
Muskegon Heights, Michigan

Perfection Stove Company  
Cleveland, Ohio

Phileo Corp., Refrigerator Division  
Philadelphia, Pennsylvania

Republic Stamping & Enameling Co.  
Canton, Ohio

Geo. D. Roper Corporation  
Rockford, Illinois

Seeger Refrigerator Co.  
Evansville, Indiana

A. O. Smith Corporation  
Kankakee, Illinois

Speed Queen Corp., Ironer Division  
Algonquin, Illinois

The Tappan Stove Company  
Mansfield, Ohio

Thor Corporation  
Chicago, Illinois

United States Stamping Company  
Moundsville, West Virginia

Westinghouse Electric Corporation  
East Springfield, Mass.

Westinghouse Electric Corporation  
Mansfield, Ohio

### Certified Safe Transit Laboratories

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Lawrence, Massachusetts

Chicago Mill and Lumber Company  
Chicago, Illinois

Container Laboratories, Inc.  
Chicago, Illinois

Cozier Container Corporation  
Cleveland, Ohio

The Fairfield Paper & Container Co.  
Baltimore, Ohio (project 1-a only)

General Box Company  
Chicago, Illinois

The Hinde & Dauch Paper Company  
Sandusky, Ohio

Inland Container Corporation  
Indianapolis, Indiana

International Paper Company  
Georgetown, South Carolina

Ohio Boxboard Company  
Rittman, Ohio

Package Research Laboratory  
Rockaway, New Jersey

Packaging Service Corporation  
Wyncote, Pennsylvania

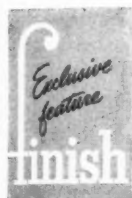
Don L. Quinn Company  
Chicago, Illinois

U. S. Testing Company, Inc.  
Hoboken, New Jersey



# The manufacturer-carrier team can beat the loss and damage problem

by *Herman L. Cook* • NORGE DIVISION, BORG-WARNER CORP., MUSKEGON HEIGHTS, MICHIGAN



As one who has spent many years in the home appliance industry, and was for some time with the Association of American Railroads, it was suggested that my experiences with the railroads would bring out mutual problems related to the safe transportation of finished appliances and other metal products.

Many of the problems confronting the American railroads have been given wide publicity. One has been in the loss and damage account; and damage to appliances and other products, finished in baked synthetic enamel, porcelain enamel, or a combination of the two, had become quite serious.

Leaders in the metal products industry also realized that the damage to their products was quite serious, and many manufacturers had been working on the reduction of damage. Out of all of this the National Safe Transit Program was started. It was a purely voluntary program on the part of the manufacturers, and it was a pleasant surprise to the railroads that the problem of the handling and transportation of products was being studied.

## The distributor, dealer viewpoint

There are those today who dismiss the problem as one that should not concern them by saying that their cars are roughly handled, and apparently do not give the matter any more thought. However, in my contacts with distributors, dealers, and other receivers of these products, such an explanation is not always readily accepted. There are huge

warehouses which receive the products from a larger number of manufacturers. We have heard it said a few times that they could not afford



H. L. COOK

finishfoto

to handle the products of some manufacturers because their warehouses are cluttered with damaged merchandise, and with sorting and re-handling, they spent more money on the account than it was worth.

## Not a "range in a carload"

I was called in to see the damage on a carload of stoves in which there was not one stove that was not damaged. This distributor had handled appliances for a great many years, and had bought the carload of stoves from a manufacturer with whom he had never dealt before. He remarked that it was the first stoves from that manufacturer, and it would be his last. In this particular case the manufacturer had built a new model stove, it had not been tested on test machines, and they did not deliver a single undamaged stove in the first few cars shipped. This manufacturer immediately got this model to test

machines, and corrected the trouble. He learned, as others have learned, that he should have done that first.

Another manufacturer made a process change, and the stoves were tested on his test machines. The stoves would not quite withstand the standard tests, but he took the chance, shipping many cars anyway. Most of the cars arrived with complete damage, and his distributors were disgruntled. The manufacturer then made the changes he should have made at first.

## A rubber grommet

### and a welding jig

In another case, damage was at just two spots, the back top corners of the end panels, and the back corners of the stove tops. They immediately made truck shipments and the damage persisted. (A minor change in the end panel assembly had been made, and to them it was so minor they never bothered to run any tests although they did have the test machines in their own plant.) A small rubber grommet solved the end panel breakage. On the stove tops, a welding jig, which located a gusset, got out of line; this put an initial strain on the top flange, and handling alone added enough strain to damage the tops. They had not tested any stoves for some time, so the faulty welding jig was not discovered sooner. The welding jig was repaired, the stoves withstood the tests, and the damage stopped.

So in many cases such as these the railroads paid the claims largely because their representatives were not qualified to judge the cause of the damage; others were compromised; some were not paid at all. But in any event, there was loss to all concerned,

particularly the distributor and dealer who did not have complete products to sell.

One of the amazing things we encountered was the unwarranted rejection of products by the consignee for apparent manufacturer's defects, or merely because the products did not meet the quality standards the consignee had in mind. We have seen many such products so rejected, or an exception report requested when there was absolutely nothing wrong with the products. They were good

products from manufacturers who were making good, commercially acceptable merchandise. This has always been a problem with manufacturers, but in cases such as these railroad representatives are placed in the embarrassing situation of trying to settle such a dispute with a customer of theirs who has bought transportation. In many cases, the consignee feels that the railroads thoroughly inspect every article offered to them for shipment.

The freight claim agent for a rail-

road is one who is always in the middle. By law, the carrier is responsible for transportation damage, and also by law is required to investigate claims fully and not pay for anything but transportation damage.

#### The "labor for repair" bills

One of the largest items in claims is usually the labor repair bill. It

#### Editor's Note:

Herman Cook recently rejoined the ranks of the appliance manufacturers (Norge Division of Borg-Warner). He was for many years connected with appliance and metal products manufacturers, and can be presented as an authority on metal finishing. More recently, Mr. Cook has been working with the Association of American Railroads (as ceramic engineer in the freight claim department), and worked with the producers in helping to "discover" sources of loss and damage to finished products. His comments should be of interest to both shippers and carriers.

## FIBER-and-STEEL STRAP CUSHIONS AS IT BINDS



For Internal  
Bracing

Prevents  
Shipping  
Damage

Cuts  
Shipping  
Costs

FIBER-and-STEEL is steel strap with a cushion of protective Kraft paper around it. You can apply FIBER-and-STEEL directly on the enameled surfaces of stoves, refrigerators and other similar products with *no cushioning needed* between the product and the strap. The outer layers of Kraft paper protect the surface. The inner layer of steel strap binds with a slip-proof grip.

FIBER-and-STEEL saves time and materials in packing, makes uncrating easy, and leaves no adhesive stains. It is secured with a soft aluminum Gerrard seal.

WRITE OR WIRE TODAY  
FOR A TEST DEMONSTRATION  
IN YOUR PLANT



1958 Hawthorne Place, Melrose Park, Ill.  
(Chicago Suburb)



Strap calculator.  
Write for  
your free copy.

seems that many consignees like to make a nice profit on this. In one case, stoves were returned to the factory for repair; the consignee, in the claim that he filed, added \$10.00 a stove above the price the manufacturer charged. In this case, the manufacturer told his distributor that such a practice would not be tolerated. In another case, a consignee charged \$3.50 per stove for touching up with paint two spots on the black porcelain enamel base of stoves. The breakage was in a place that could hardly be seen, but it seemed a good way to make some extra money.

#### The shipper pays the bill

It is to the credit of the manufacturers that they do all they can to stop such practices. It is obvious to them, as it should be to all, that when rates are set up, the past claim experience on the commodity is studied and considered.

We conferred on a situation where the manufacturer had an excellent package for his product. Damage got heavy again, and it was found the manufacturer had gone back to a cheaper package. Studies of recent claims on this article bore out the

fact that the railroads were hauling it for nothing. Many impact register studies were made, and it was obvious that it was not transportation damage. The product was merely packaged in a container that was highly inadequate, a fact this company had proven once before. Such thinking does not help those shippers who are constantly doing a good job.

If all would realize, as many do, that handling contributes to damage, an ultimate reduction in damage would result. A packaging engineer for a large corporation recently saw a truck driver dropping one of their products off the tail gate of a truck. When the engineer objected to such practice, the truck driver retorted that it did not hurt if he dropped it squarely! Another large manufacturer, in addition to the standard tests on the vibration table and the Conbur incline impact tester, also subjects all of his products to a 14-inch drop test. He certainly is convinced that handling causes a great deal of damage.

The railroads campaign relentlessly on the subject of loss and damage prevention. Now, with the National Safe Transit Program and other similar constructive programs, the product manufacturers are showing their keen interest in the solution of these mutual problems. Top management of both manufacturers and carriers can see the impact of extensive losses on manufacturing and transportation costs, and on distributor, dealer and consumer goodwill. An increasing number of manufacturer executives are encouraging their shipping divisions—in fact insisting—that proper precautions be taken to insure safe packaging and shipping. In turn, there is an accelerated effort on the part of the carriers to cooperate.

The problem can be licked through cooperative effort on the part of the "manufacturer-carrier team." Much progress has been made and it is anticipated that manufacturers will turn to some kind of adequate pre-testing plan in increasing numbers to eliminate losses on their own products. It has been done by many, and it can be done by all.

finish DECEMBER • 1950

## 50 YEARS OF BETTER BOXES—"THE American WAY"



Porcelain ware packed in American Wirebound Crates save money for this customer.

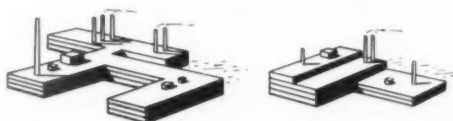
### Here's Super-Protection for Shipping Your Sanitary Ware and Appliances!

You can't count your profits until your products are *delivered—intact, undamaged!* That's why American box engineers and technicians have devoted half a century to the development of improved boxes and crates which do a *better job* for you, at *lower cost*.

Today, you are getting the accumulated benefits of those 50 years of progress in every American shipping container you use. You get *extra protection* for fine finishes—you get *extra support* for resisting shocks and stresses. You get the all 'round *best* that money can buy—for *less*, thanks to economies of American's modern manufacturing efficiency. Are you getting the most for your shipping dollar? Check with American today—and see for yourself.

#### TWO GREAT PLANTS (Est. 1901)

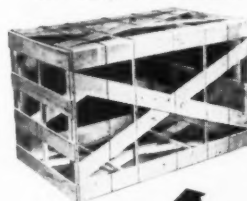
Centrally located in Cleveland, Ohio, and Marion, South Carolina; featuring most complete modern facilities for serving American industry.



## THE American BOX CO.

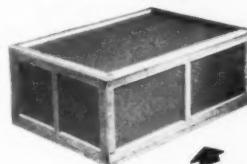
1902 W. 3RD ST.  
CLEVELAND 13, OHIO

MARION,  
SOUTH CAROLINA



#### WIREBOUND CRATE

Strength-tested, lightweight. Built-in support features. Easy handling, stacks well. Supplied flat for wrap-around assembly.



#### FIBREBOARD BOX

Attractive, low-cost. Fully enclosed, panels steel stapled to wood cleats. Superior reinforcements. Supplied flat for easy assembly.



#### NAILED WOOD BOX

Materials and workmanship to meet or surpass Government Specifications for domestic or export shipments.



## International trade association award based on National Safe Transit Program



*Edward Mackasek (right), managing director of the Porcelain Enamel Institute, is shown presenting the ATAE Award plaque to Dana Chase, editor and publisher of *finish* and "father of the Safe Transit idea," who also represented Ralph F. Bisbee, NST general chairman, and to F. L. Meacham, 1950 president of the Institute.*

**T**HE American Trade Association Executives, an international society of professional trade association men comprising representatives of more than 1200 trade associations, bestowed a high honor on the Porcelain Enamel Institute by conferring upon it an "Award of Merit for Distinguished Service," at its recent annual convention in Boston, Massachusetts. The award was made to the PEI for excellent services to industry and especially for the Institute's part in the development and coordination of the National Safe Transit Program.

These highly prized awards are made to associations that have performed outstanding service for their industries and the public, and are regarded as the highest and most authoritative recognition of association achievement. Only 137 such awards have been made over a period of 20 years.

The chairman of the jury on awards this year was Secretary of Commerce Charles Sawyer. Other members of the jury on awards were Otto A. Sey-

ferth, president, Chamber of Commerce of the United States; Claude A. Putnam, president, National Association of Manufacturers; Dr. Lee Bidgood, dean, School of Commerce and Business Administration, University of Alabama; and Dr. H. V. Olsen, dean, Amos Tuck School, Dartmouth College.

The Institute's presentation was based on the National Safe Transit Program, which not only has benefited the home appliance and allied metal products industries by enabling them to reduce shipping damage, but has pointed the way for other industries to solve their shipping problems by adopting similar procedures.

Presentation of the award plaque was made before the annual PEI banquet at The Greenbrier Hotel, White Sulphur Springs, W. Va., during the recent Institute annual meeting. Edward Mackasek, PEI managing director, presented the plaque to F. L. Meacham, 1950 PEI president, and to Dana Chase, representing both *finish* magazine and Ralph Bisbee

(Westinghouse Electric Corp.), general chairman of the National Safe Transit Committee.

**"packing costs reduced 20 to 30%"**

**To NST Committee:**

"With great interest we are following the development of your test procedures of which we are informed through *finish*, and the articles issued by the Enameling Institute. Your standard testing equipment for smaller parcels has been in operation for some time in our plant and the result is that some of our packing costs have been reduced from 20 to 30%.

"At the present time we are installing a Conbur incline testing device and a vibration testing machine according to your standards. There are a few questions with regard to the Conbur incline tester and we would be very thankful to you for answering them . . ."

Therma Electric Heating  
Mfg. Co., Ltd.  
Schwanden, Switzerland

**this is quoted from one of many letters indicating widespread interest in the NST program among organizations in other countries**

### Editor's Note:

As a result of the steadily growing interest among *finish* readers in the need for improved packaging and shipping methods, and as a result of the accelerating importance of the National Safe Transit Program to all producers of major home appliances and allied metal products, it is the decision of *finish* editors to devote a complete section in each issue to this pertinent subject.

This "magazine within a magazine" will report on the activities of all divisions of the NST Committee, and in addition will carry "plant experience" information of value to everyone interested in the problem of packaging and shipping improvement and loss prevention.



# Is your plant in tune with modern materials handling?

by *Don W. Kelsey* • UNION STEEL PRODUCTS CO., ALBION, MICHIGAN

**W**E have come a long way since the end of World War II in answering the problems of materials handling and packaging and shipping. During the early part of that war, packaging and handling were given little consideration. However, when the records disclosed the fact that 50% of the parts shipped abroad to our Armed Forces were unusable on arrival, the Ordnance Department began to understand the value of proper packaging and handling of materials. Finally, in the last days of the war, materials handling equipment was given a priority, and a real effort was made to improve handling methods.

## A new recognition

Since the end of World War II, materials handling as an industry has grown in stature. Practically every company of any size has a materials handling department; often it is a staff function. Most universities in this country have courses in materials handling; in some it is a required course in the industrial engineering curriculum.

The Defense Department, too, recognizes the importance of materials handling. I was called in recently on one of the new defense projects and was gratified to hear that the original appropriation included a very substantial and ample sum for handling equipment.

## Recognized by labor

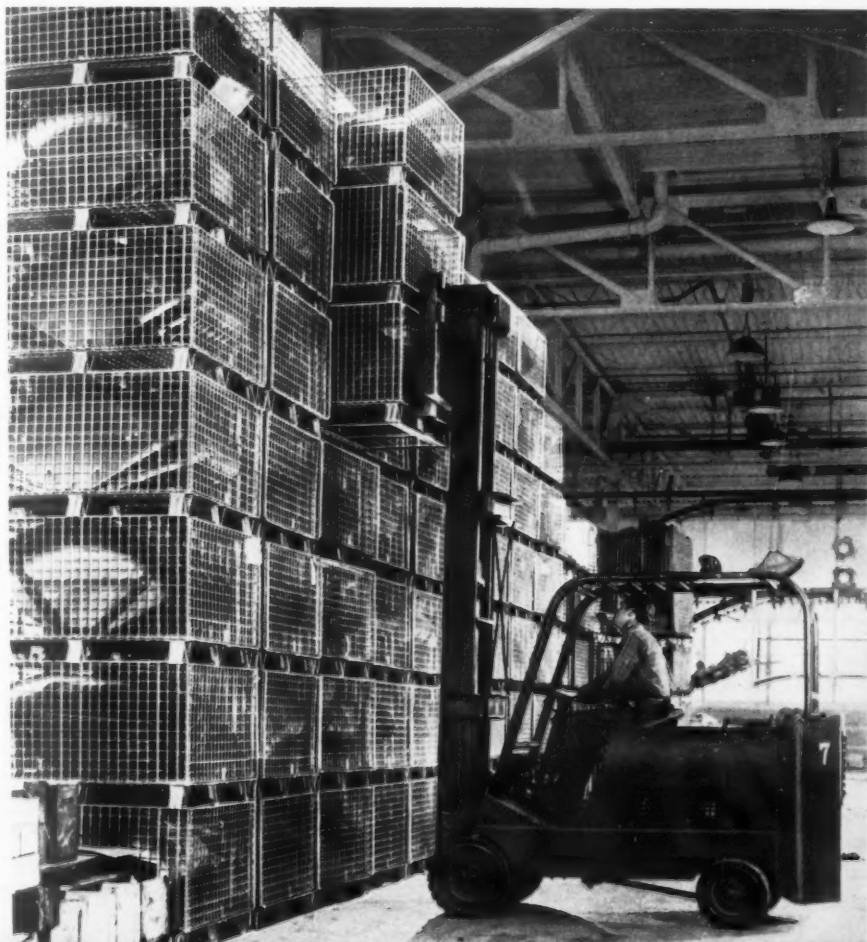
Another evidence of the recognition of materials handling as an industry

*With modern materials handling equipment, horizontal storage areas can be converted into cubic storage space.*

appears in the recent contracts signed between some of our largest corporations and their labor unions. These contracts provide as one of their conditions that unions will permit and encourage the use of labor-saving devices to cut production and handling costs. To me, that seems a great victory for industry. We are free to go ahead with technological improvements to improve handling methods.

This new attitude of labor unions contrasts sharply with the attitude I found in England during this past summer. In discussing the question

of labor-saving devices, some industrialists in Birmingham told me that the British labor unions are bitterly fighting any further mechanization in industry. When fork trucks were introduced on the London docks, there was a strike until the management agreed to have a worker walk alongside each industrial truck. English industry can introduce modern equipment only if it does not lay off a single worker in the process. If a thousand dock workers were employed 50 years ago, the same number must be employed now.



One of the greatest assets of American industry is its ingenuity for substitution. Whenever the cost of a product or a service becomes too high, the engineer sets about to create a substitute. And, so, when materials handling costs rose to such a high level—according to a survey by "Industry and Power" they account for over 36% of total production costs—management began to realize the need for a substitute for manual handling labor.

For some time emphasis was focused on the handling of materials within the individual plant. Little thought was given to the improvements which could be made in the flow of material from one plant to another or to its distribution point. Each company was concerned with how efficiently material could be moved to its own shipping room; none studied how cheaply it was transported or how easily it was received at destination.

In the past few years, however, companies have begun to cooperate with each other and with the carriers to improve shipping, transporting and receiving methods. And in this field the pallet and the container have

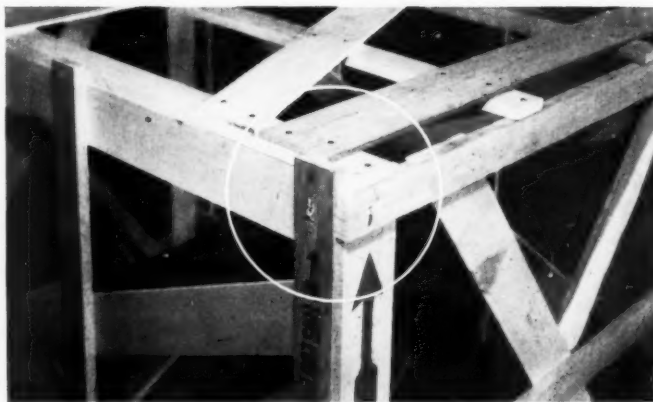
#### Editor's Note:

The majority of the packaging and shipping articles in *finish* have covered problems of pre-testing and proper packaging and shipping of the finished appliance or metal product.

All manufacturers have, to some degree, problems of transporting and storing parts, components and materials other than the finished packaged product.

This article by Mr. Kelsey is concerned with the latter problem, and should be of interest to all *finish* readers who are responsible for materials handling and product transportation.

## This TIGHT Hinge Corner Makes a STRONGER Crate



The exclusive "Tight Corner" Hinged Crate produced by Bigelow-Garvey offers a degree of rigidity and strength impossible in the ordinary type of collapsible crate. This one feature alone is enough to win the praise of your shipping department. Other features such as pre-drilled nail holes, completely collapsible design, and hardwood construction throughout make for ease of assembly and adequate protection.

Bigelow-Garvey has pioneered in the design and manufacture of crates for safe shipment of porcelain enameled

appliances such as stoves, washing machines, ironers, freezers, sinks, bathtubs and similar products for more than twenty-five years. You get the benefit of this experience when you bring your packaging problems to our engineers.

For domestic packaging or for export packaging in either open or completely closed crates, let us submit our ideas and prices for "safe shipment" containers.

Our crates are built to pass the tests prescribed by the National Safe Transit Committee.

Also

BOX SHOOKS

PALLETS

PALLET BOXES

Write us regarding your shipping problems.

# BIGELOW-GARVEY LUMBER CO.

General Office and Laboratory

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found their place in the sun. Pallets and containers are a vital element in the improvement of shipping methods, for they are the only equipment serving the product from production line or warehouse to the receiving room or assembly line to destination. Pallets and containers have been referred to by traffic men as transportation facilities, justly deserving of favorable freight rates. While traffic men and materials handling engineers could see the value of unitized shipping both to industry and to the carrier, it was difficult to prove that fact to the carrier. We had to proceed slowly. We made many test shipments and ran time studies on the operations. We showed the carrier that unitized shipping would cut their detention time materially, making it possible for them to move a great deal more freight with the same number of men and trucks. In one typical example, a trailer hauling loose material moved 20,000 pounds of freight in a 48-hour period. In the same length of time it could move 93,320 pounds of palletized freight. So the revenue of that truck was over 4 times as great under modern handling methods.

Carriers now also realize that container movement of material greatly reduces freight claims for loss, damage and pilferage, due to the elimination of piece-by-piece handling. I

should qualify that statement and say that "properly engineered" container movements eliminate most freight claims.

The fact that industry now realizes the importance of palletized shipping



DON KELSEY

is clearly apparent from the multitude of proposals now pending before the freight rate bureaus of common carriers throughout the country, for reduced freight rates on pallets and palletized materials. Many such rates are now in effect.

Recognition of pallets reached a high point recently when the National Motor Classification Board originated and approved a proposal to accord palletized freight the lowest ratings applicable to any form of packaging.

"Pallets and containers" is such a broad term that it brings up the question "What kind of pallet and container?". The answer is not so simple as it may appear. It is a question of choosing the proper equipment for each particular adaptation and yet standardizing this equipment for maximum economy and usefulness. Materials handling equipment is not a standard item which can be bought by the purchasing agent as he buys nuts and bolts. It must be engineered out to meet all the conditions of the particular movement concerned.

First, the materials handling man must choose between a completely expendable container, a relatively short-lived re-usable container, and a permanent-type container. Management has been rather reluctant to authorize the purchase of large quantities of

permanent-type pallets and containers. This is due to the fact that in most organizations such expenditures can be made only as a project. Of course, they are always a capital investment. Expendables, on the other hand, require no complicated project-procedure and are charged into expense.

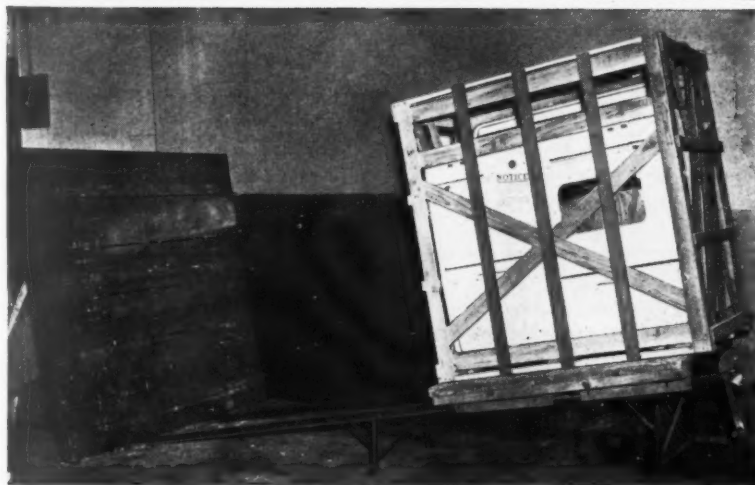
Another impediment to the greater use of permanent-type containers has been the high cost of returning these containers to the shipper. This ob-

stacle has now been overcome by the publishing of tariffs reducing the rate on returned containers to one-half of the fourth class rate.

#### Should containers be expendable or permanent?

It is a question of selecting the right tool for the job. Many applications are adaptable to the use of expendable containers. This is particularly true where the material is of relatively light weight and of uniform

## WEYERHAEUSER CRATES



### SHOCK TESTED TO PROVE STRENGTH

● Crates designed by Weyerhaeuser are built to withstand the impact and vibration tests recommended by the Porcelain Enamel Institute. These tests simulate shocks received in shipment—to prove adequate protection for contents, the first essential in good crating.

Weyerhaeuser Crates are engineered to give needed product protection—economically. Their open design permits easy inspection. Diagonal bracing is 65% stronger

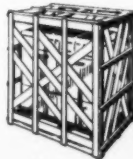
than strut bracing. Corners are nailed for maximum strength and rigidity. To lower assembly costs, and to eliminate costly pre-drilling for nailing, the pieces that receive nails are of soft non-splitting hardwood.

In 18 years of designing and building, Weyerhaeuser has supplied leading stove manufacturers with superior, engineered crates. Your inquiry will receive prompt and experienced attention.

## WEYERHAEUSER SALES COMPANY

INDUSTRIAL WOOD PARTS DEPARTMENT

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size and shape. Often, however, expendables are used when the loads are too heavy to insure safe arrival at destination. This condition is unfair to the carrier and is one of the reasons he has been reluctant to go along with our reduced-rate program. At all of the hearings I have attended, carriers cite cases of damaged shipments due to inadequate containers. Another complaint is that shippers will use expendables a second or even third time — instead of discarding them, as they should, after the first successful trip.

#### Choosing the container

Many new materials are being developed to improve the quality of corrugated and solid fibre containers. Research has proven that, in general, hardwoods are preferable to soft woods. Gums and oaks from the southern states are now being used rather extensively and to good advantage; also aspen, cottonwood, and birch are suitable; and, from the Pa-

cific Coast, Douglas fir is becoming a popular material.

The chief requirements for corrugated and solid fibre boxes are resistance to moisture, grease, acids, bacteria, and flame. Also important are stiffness, wet strength, tear and closure.

The container manufacturer, with new materials and treatments, has the ability to produce almost any kind of container desired. The materials handling engineer must decide whether the cost of the package he prefers is justified in the application concerned.

In many movements, the use of a permanent type of container will be found to be most advantageous. This is particularly true when the material is excessively heavy such as with forgings or castings. With a permanent type of container the problems caused by atmosphere, acidity, grease and flame are non-existent. Damage claims are at a minimum and the material receives maximum protection at all

times. The higher initial cost is spread over so many trips that it becomes negligible.

#### Possibilities for standardization

The standardization of pallets and containers is an important factor in the development and expansion of unitized shipping. A few years ago every company wanted containers built to its own special specifications. There were requests for every size container imaginable. Gradually we have assumed some semblance of standardization. This is particularly true in large corporations where shipments are made between many different plants, and where equipment is often interchanged. In general, a pallet or container with dimensions of 40" by 48" seems to be the most practical. This size fits into both a truck trailer and a railroad car, leaving enough space at the side for a fork truck to operate.

For warehouse use, other sizes are sometimes preferable. Many ware-

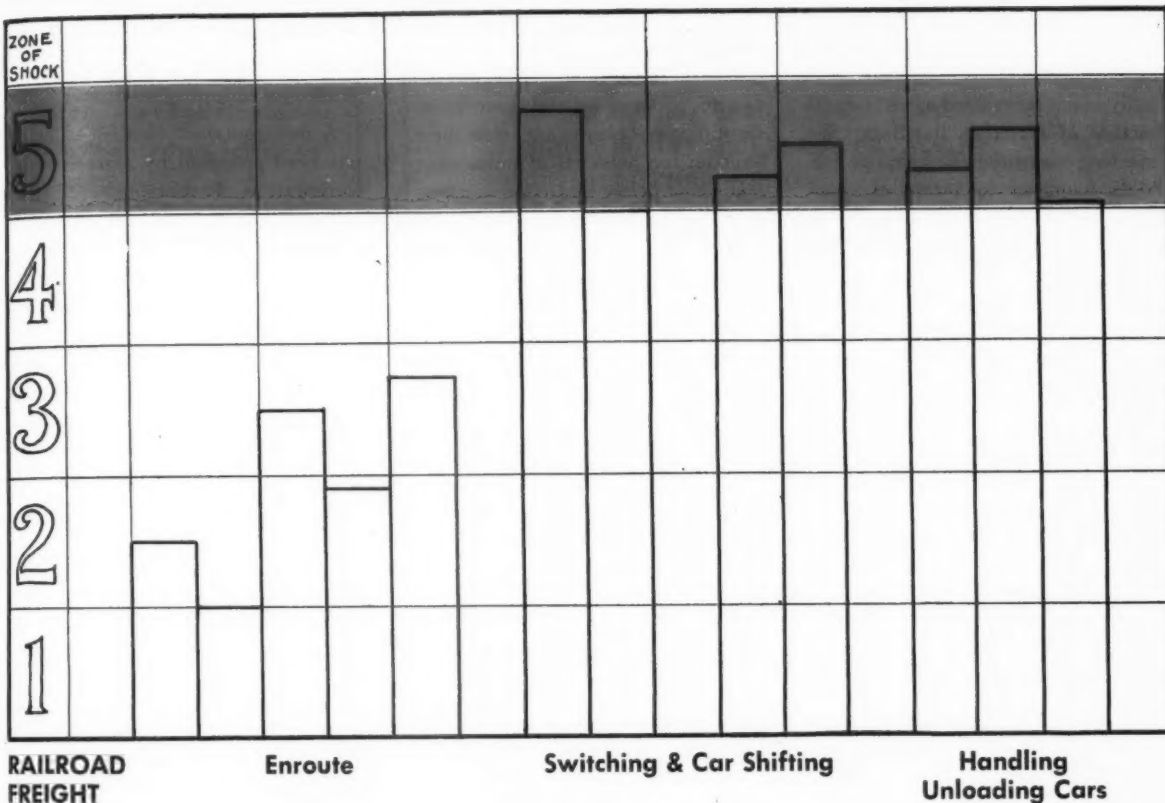


Below: Group 3 (wirebound boxes & crates) winner in 1950 Protective Packaging Competition, sponsored by Society of Industrial Packaging and Materials Handling Engineers, was Earl Forsberg, of Ohio Chemical & Surgical Equipment Co. Left: A surprise package at SIPMHE's 1950 exposition (see November 1950 finish).





# What does 5<sup>TH</sup> ZONE mean to you?



**F**FIFTH zone impact may mean little or nothing to you, but you can bank on it the executives and packaging and shipping engineers who have studied the National Safe Transit pre-shipment testing program for reducing shipping losses have learned to know its meaning.

As the editorial spearhead of the NST Program, **FINISH** carries *complete* information on methods for reducing shipping losses and promoting safe delivery of packaged finished appliances and allied metal products.

A perfect editorial tie-in for the advertising of quality products and equipment for the packaging and shipping department.

These service organizations and manufacturers of packaging and shipping materials advertised in **FINISH** during 1950

Acme Steel Company  
American Box Company  
Bigelow-Garvey Lumber Co.  
Chicago Mill & Lumber Co.  
Cleveland Impact Recorder Inc.  
Container Laboratories Inc.  
Cornell Wood Products Co.  
General Box Company  
A. J. Gerrard & Co.  
The Impact Register Co.  
L. A. B. Corporation  
Minnesota Mining & Mfg. Co.  
Pomeroy Manufacturing Co.  
Rathborne, Hair & Ridgway Box Co.  
J. Frank Seely & Son  
Signode Steel Strapping Co.  
United States Testing Co.  
Watkins Container Manufacturers  
Weyerhaeuser Sales Company  
Wirebound Box Mfrs. Assn.

*Dana Chase* **PUBLICATIONS**

360 NORTH MICHIGAN AVENUE • CHICAGO 1 • ILLINOIS  
TELEPHONE Central 6-1229

*finish*

houses now in use require a smaller size container. However, conditions in warehouses are changing rapidly; with the development of retractable forks on trucks, much valuable aisle space is saved. Also, space-saving is finally being recognized as an integral function of materials handling. We have long measured the value of materials handling in terms of man-hours saved, but not in terms of square-feet saved. When one takes into account the high fixed charges on every foot of warehouse space, containerized storage becomes an essential procedure. We now consider storage in terms of cubic feet, rather than square feet. The question today is "How high can we go?". This is an important factor, especially in locations where space is at a premium and where new construction, at its present exorbitant cost, would otherwise be mandatory.

#### **Warehouse location gets attention**

The increased use of mechanized handling in our warehouses has changed our conception of the location of such distribution centers. Consider how many warehouses are located near the centers of large cities.

Goods shipped into and from these warehouses often have to move over extremely congested streets. In addition, many of these warehouses are multiple-story buildings which are inefficient due to the necessity for moving material up and down by elevator. Warehouses are now being built on the outskirts of cities where real estate prices and taxes are lower and where shipping may be done around the cities rather than through them. These warehouses are usually one-story buildings constructed to use mechanized handling equipment.

Manufacturing plants are also moving out of the cities and into the suburbs where they can spread out horizontally instead of being forced to build up vertically.

Think of all the warehouses and industrial plants that are poorly located from the standpoint of materials handling and which will not be able to compete on a basis of distribution cost with those new industries built to take advantage of unitized shipping and internal mechanized handling. The development of new and better handling and shipping methods is a great threat to the existing established plants. *It takes years*

*for a building to depreciate but it may become obsolete in a day by the development of new technological processes which make it no longer efficient.*

#### **A 40-foot shipping container**

A new container idea for shipping has been proposed by Harnischfeger Corporation. It is a container made of steel or aluminum, 40 feet long, 8 feet wide, and 8 feet high. The containers would be carried by railroad flatcars on long hauls and then transferred by crane to flat truck trailers for delivery to destination. This would eliminate loading and unloading goods between the shipper and receiver, and would reduce cost and speed up delivery of railway shipments. Other plans might involve smaller containers, two or more of which would be loaded on a flatcar. This system is now being used in loading cotton goods shipped from Georgia to Chicago; two steel containers carrying 20,000 pounds each are loaded on a flatcar. Systems such as these may mean more business for the railroads. The loading and unloading operations have always worked against the railroads. If proper containers would be used by industry, and if the railroads themselves were willing to cooperate, more efficient movements could undoubtedly be devised.

To me, the most important aspect of the pallet and container field is for industry to use proper units for each item. We must be fair to the carrier; we must not expect him to carry shipments in inadequate containers which will cause excessive damage claims. If we package properly, we will be entitled to — and the traffic men of industry will get for us — preferential freight rates. If we are using permanent type pallets and containers, we must see that their return will not work undue hardship on the carrier. Containers should be light in weight, collapsible and easily handled by the carrier. Then the carrier can afford to return our containers at a minimum rate, and they, as well as we, will benefit from the increased efficiency due to unitized handling and shipping.

#### **Versatile unit for heavy materials handling**



*This new mobile unit, with retractable wheels for ground travel, can facilitate yard and in-plant methods of railway car handling. With maximum draw-bar pull of 7350 pounds, it may be used for hauling, spotting and switching cars. Changeover to ground operation requires only 30 seconds.*

## APPLIANCE AND METAL PRODUCT MANUFACTURERS

Send for a FREE sample copy  
of an important new selling aid:  
"Basic Facts about Porcelain  
Enamel—for Retail Salesmen."

Address reply to Box 1250, c/o finish,  
360 N. Michigan Ave., Chicago 1, Ill.

## NEWS → from Page 54

12. He has been with the company since 1916, starting in the accounting department.

He was president of the American Home Laundry Manufacturers' Association for three terms, including a period in World War II, and also was wartime secretary of the industry group. In the war effort he was active in obtaining an Association-wide contract for the manufacture of anti-aircraft machine gun mounts.

## PENNSALT UPS CLEM

Albert H. Clem has been appointed to the newly created position of assistant to the vice president in charge of sales, Pennsylvania Salt Manufacturing Company, it was announced by William P. Drake, vice president. Clem formerly was assistant manager of sales in Pennsalt's special chemicals department.

## VITRO NAMES SO. CALIF. REP.

The Vitro Manufacturing Company has announced that Westwood Ceramic Supply Co., of Los Angeles, is now the company's Southern California sales agents. Theodore Lenchner, Vitro vice president, explained that Westwood will handle all sales and distribution of Vitro products in that area. Westwood will carry stock of Vitro colors in their warehouse available for prompt delivery, stated Ernest Sherrill, manager of Westwood.

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"I saw your ad in finish"

## PEMCO WINS AWARD FOR 1949 ANNUAL REPORT

According to an announcement by Weston Smith, director, Tenth Annual Survey of Annual Reports conducted by *Financial World*, Pemco Corporation, manufacturers of porcelain enamel finishes, ceramic colors, and related materials, has received the 1950 citation for the third best 1949 Annual Report of the Paint and Coatings Industry.

The citation was awarded October 30, at the Sixth Annual Report Awards Banquet, held at Hotel Statler, New York City. Karl Turk, Jr., vice president and treasurer of Pemco, accepted the citation for his company.

## NAM INDUSTRY MOBILIZATION CONGRESS, DECEMBER 6-8

A "Mobilization Congress of American Industry" will be held at the Waldorf-Astoria, New York City, December 6, 7 and 8, as part of the 55th annual meeting of the National Association of Manufacturers.

Speakers will include W. Stuart Symington, chairman, National Security Resources Board, discussing "The Call to Defense"; Claude A. Putnam, NAM president, on "Free Enterprise in a Garrison State"; Clarence B. Randall, president, Inland Steel Company; Lewis H. Brown, chairman of the board, Johns-Manville Corporation; Maj. Geo. Fielding Elliot, military analyst; Ira Mosher, chairman, NAM Industrial Mobilization Committee; Earl Bunting, NAM managing director; and Charles R. Sligh, Jr., chairman, NAM Taxation Committee.

Advance registrations should be mailed to National Association of Manufacturers, 14 West 49th St., New York 20, N. Y.

## FOUR SUBSIDIARIES OF U. S. STEEL TO BE MERGED

Carnegie-Illinois Steel Corporation and three other subsidiaries of United States Steel Corporation will be regrouped into a single operating company to effect a simplification of the corporate structure of the parent company.

Irving S. Olds, chairman of the

board of U. S. Steel, announced that the change, scheduled to go into effect January 1, marks the end of the Carnegie-Illinois name which was adopted in 1935 when Illinois Steel Company and Carnegie Steel Company were merged.

The new wholly owned subsidiary will be named United States Steel

Company, and will include, in addition to Carnegie-Illinois, the H. C. Frick Coke Co., United States Steel Corporation of Delaware, and United States Coal and Coke Company. Headquarters will be in Pittsburgh, Pa. Virtually no change in personnel, operation, or facilities is contemplated, said Olds.

## STOVE MEN TO MEET IN CINCINNATI, DECEMBER 4-6

A program to help stove manufacturers "get a clear view of what's ahead" is being prepared for the Winter Meeting of the Institute of Cooking and Heating Appliance Manufacturers, to be held at the Netherland Plaza, Cincinnati, December 4-6.

Headliners on the program, as announced by ICHAM, include Harold Boeschstein, president of Owens-Corning Fiberglass Corporation and production vice chairman of the former War Production Board, discus-

sing "Business Risks in a Mobilized Economy"; Alden P. Chester, president of Globe American Corporation and former ICHAM president, speaking on "How Does All This Affect Our Future Outlook?"; Brig. Gen. Andrew D. Hopping, U.S.A., chief of supply division, Office of the Quartermaster General, explaining "Government Procurement and Policies and Procedures"; and Pauline Dunkel, ICHAM executive secretary, presenting a "Report from Washington".

## REFRIGERATION EQUIPMENT MANUFACTURERS, WHOLESALE MEET AT WHITE SULPHUR SPRINGS

Nearly 300 executives of the refrigeration industry, representing members of the Refrigeration Equipment Manufacturers Association and the Refrigeration Equipment Wholesalers Association, met at The Greenbrier, White Sulphur Springs, W. Va., November 2-4, for a joint membership meeting.

Feature speaker was U. S. Senator Styles Bridges (New Hampshire), who presented an address entitled "America's Choice Today." Other speakers included J. S. Kimmel, president, Republic Electric Co., Davenport, Iowa, who spoke on "Things for

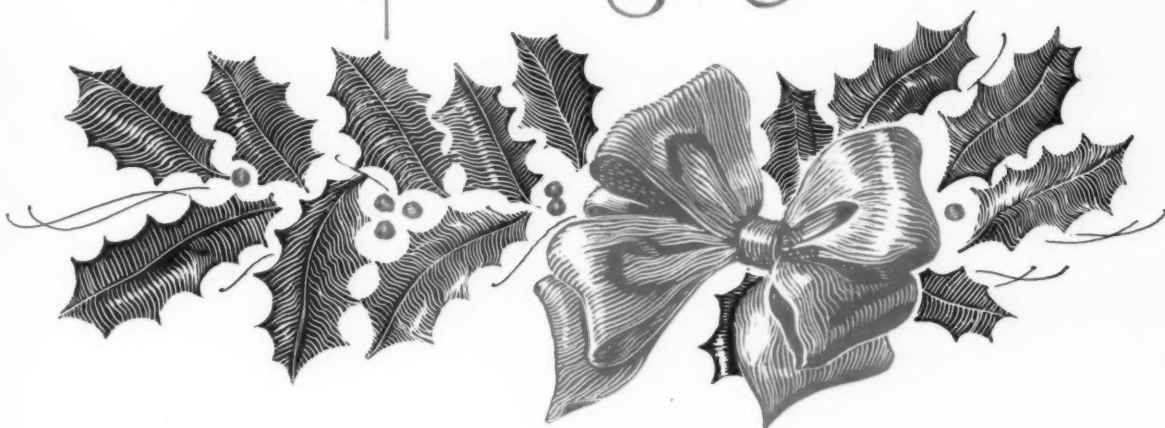
Jobbers to Think About"; Col. J. D. Griffing, chief, Manpower Division, Selective Service System, Washington, D. C., who presented "Manpower Problems as Related to Selective Service"; Thurman Sensing, director of research, Southern States Industrial Council, Nashville, Tenn., whose subject was "The Value of a Dollar Bill"; R. H. Israel, president, Refrigeration Equipment Manufacturers Association, who spoke on "The Value of Association Membership"; and Edmund H. Harding, humorist, of Washington, N.C., who answered the question "Shall We Freeze Things?"

*At speaker's table at membership banquet, left to right, are: E. C. Marsden, REWA president; E. H. Harding, humorist; R. H. Israel, REMA president; Jack Glass, 1st v.p., REWA; John E. Dube, secretary, REWA.*





# Greetings



To the entire industry, the Ingram-Richardson Company  
extends its friendliest greetings. ★ As never before in world history,  
the birth of the Redeemer should be celebrated in its true  
spiritual significance, with devout prayers for guidance.

Now, more than ever, we must greet the New Year with hope  
and faith that such guidance will lead men of all nations  
along the path of Peace. ★ We join you, and all men of good will,  
in this earnest plea for divine counsel,  
that mankind may be saved from itself and the spirit  
of Christmas be rekindled throughout the world.

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ingram-richardson mfg. co., of indiana, inc.

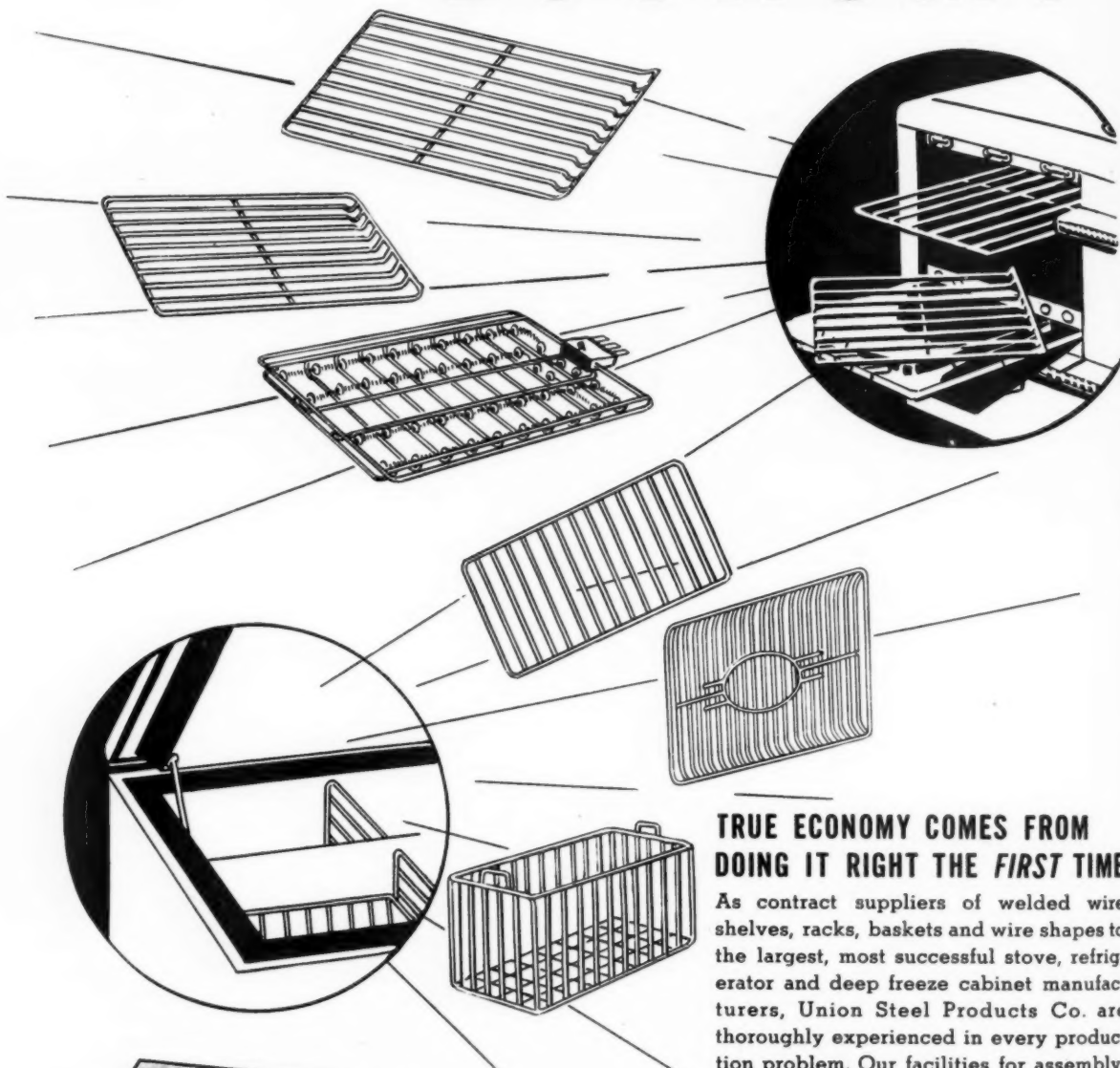
OFFICES, LABORATORY AND PLANT

FRANKFORT, INDIANA



PRE-ENGINEERED

# ECONOMY



## TRUE ECONOMY COMES FROM DOING IT RIGHT THE FIRST TIME

As contract suppliers of welded wire shelves, racks, baskets and wire shapes to the largest, most successful stove, refrigerator and deep freeze cabinet manufacturers, Union Steel Products Co. are thoroughly experienced in every production problem. Our facilities for assembly-line production and in-plant finishing are complete. Let us match our ideas with yours and demonstrate our pre-engineered principle of construction which has been so successful in improving quality and reducing cost. We invite your inquiry.

**SHELVING SPACE IS SELLING SPACE...**  
**LET US HELP YOU MAKE THE MOST OF IT!**

**UNION STEEL PRODUCTS COMPANY**

WIRE PRODUCTS DIVISION

ALBION, MICHIGAN



Contractor of welded wire Shelving and Baskets—Manufacturers of Wire Pallets and  
PALLETAINERS for material handling and shipping—WENDWAY Conveyors for plant efficiency

# ADVANCE TOOLING *overcomes* "DOUBLE TROUBLE"

**New Tooling Method by ADVANCE  
Solves Tough Stamping Problem**



Former methods of stamping double sump sinks were complicated and costly. Each half was drawn separately, then butt welded together to form a complete double-well sink. This method presented two major difficulties . . .

**TROUBLE NO. 1** In addition to processing two separate parts, extra time and labor was required to trim, butt weld, and finish welding seam—greatly increasing the cost of the piece.

**TROUBLE NO. 2** The welded seam always caused headaches after enameling. Enamel chipped off during production, in the warehouse, and often in the field where the full sales price of the product became a total loss.

Tooling for medium and large difficult stampings, like the ones shown, is ADVANCE's specialty. Complete try-out facilities for large parts are available—saving you valuable production time on your presses. Our competent engineering department and complete plant facilities are ready to help you at any time.



Automatic Dispenser Front (24½" x 61")



Refrigerator Door Panel (28½" x 43")



**Write for Bulletin**  
describing  
ADVANCE methods and  
techniques.

**ADVANCE** engineers developed an entirely new method of deep drawing both wells of this double sump sink from a single enamel sheet. Saving time and money, this outstanding ADVANCE tooling method eliminates welding and troublesome strains in the stamping—leaving it in perfect condition for enameling.

This is typical of ingenious and progressive ADVANCE techniques—which can help you reduce your production costs and simplify your stamping operations. We have the experience, engineering skill and mechanical facilities to meet your tooling requirements. Consult us on your problem—write today for complete information.

## ADVANCE DIE & TOOL CO.

6800 MADISON AVENUE

CLEVELAND 2, OHIO

PHONE: WOodbine 1-9191



"Swivel Action  
Stopped Me!"



"Sensible - Practical  
Features Sold Me!"



Dealers everywhere are finding...

## TK Monotubes ARE "LOADED" WITH RANGE SELLING ADVANTAGES!

There's no question about it! Ranges equipped with TK Monotubes sell faster.



Easily demonstrated, "Swivel-

action" permits the cooking coil to be raised, to stay up, by itself.



As a result, cleaning is simple, fast. In fact

this is the most easily cleaned unit made!



Quick, uniform, cooking heat is another TK Monotube advantage.



This flat, rugged coil provides up to 32.8% more contact with cooking utensils. Dealers



say, "the

TK Monotube is the richest, sturdiest looking unit we've seen."



Over 50 manufacturers say, "TK Monotube

is one of the best sales features we have on our ranges."

Housewives quickly appreciate the many advantages of TK Monotube cooking units. Dealers find that all they have to do is lift the coil to demonstrate the simple, easy, work-saving features of Monotubes and they practically have a range sale "buttoned-up". Women quickly

visualize hours saved in the kitchen, promptly sell themselves on your range. These are only a few of the many reasons why today most merchandising-minded manufacturers equip their ranges with TK Monotubes—the units that stand alone in all ways.

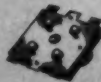


## TK Monotubes Help Sell Electric Ranges

TK ELECTRIC HEATING PRODUCTS STAND ALONE IN ALL WAYS!



OVEN UNITS



TK INFINITE CONTROL



SWITCHES AND SELECTORS



WATER HEATER UNITS



PLATINUM UNITS



INDUSTRIAL UNITS

# TUTTLE & KIFT, INC.

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